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FIELD MANUAL

ARMY PROCEDURES FOR AIRSPACE MANAGEMENT IN A COMBAT ZONE

HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 1975

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PREFACE

This manual sets forth broad Army airspace management procedures and guidance for the commander and his staff in preparation for and execution of airspace management responsibilities in a combat zone. It provides the procedural basis for establishing an integrated Army airspace management system in the current time frame using existing personnel and equipment authorizations. The procedures contained in the manual are intended to identify and clarify coordination responsibilities and to minimize airspace usage conflicts. The major thrust of these procedures is to provide a coordination mechanism that reduces mutual interference between airspace users and enhances the combat effectiveness of both ground and air weapon systems.

The manual presents a logical, mutually beneficial system that is operationally usable and recognizes the special relationship that must exist between Army and Air Force tactical forces. The organizational and operational concepts embodied in the manual are patterned after the jointly agreed procedures developed by the US Air Force Tactical Air Command, the US Army Training and Doctrine Command, and the US Army Forces Command.



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WASHINGTON, D.C., 15 July 1975

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CHAPTER 1

INTRODUCTION

1-1. Purpose and Scope

a. This manual sets forth broad Army airspace management procedures and guidance for the commander and his staff in preparation for and execution of airspace management responsibilities in a combat zone. It provides the procedural basis for establishing an integrated Army airspace management system within a combat zone. The appendixes provide a list of references, sample division and corps SOP (each with an airspace utilization plan), and a glossary of abbreviations. Unless otherwise noted, an explanation of abbreviations used in the manual are provided in appendix D. The manual is oriented toward operations within a US unified command or joint task force in a limited or general war environment, but is generally applicable in all organizations and environments. Its application requires judgment in adapting to the peculiarities of the situation, since textbook conditions will rarely exist.

b. This manual is in consonance with NATO/CENTO STANAG 2134, Offensive Air Support Operations, which is identified at the beginning of each appropriate chapter.

c. Unless otherwise noted, the organizational and operational concepts contained in this manual are based on currently authorized personnel and equipment.

1-2. Background

The joint Chiefs of Staff agreed in 1965 to a broad

concept for the control of airspace over the combat zone. The initial conceptual agreement recognized airspace as a vital dimension over the combat zone and acknowledged the need for all services to operate within this entity. In August 1974, US Air Force Tactical Air Command (TAC), US Army Training and Doctrine Command (TRADOC), and US Army Forces Command (FORSCOM) established jointly agreed to procedures for airspace management in an area of operations. This manual provides Army procedures needed to implement the TAC/TRADOC/FORSCOM agreements. It is based on FM 44-10 (Test) and MASSTER Test 152. The latter was approved by Department of the Army as a basis for airspace management evaluation.

1-3. Recommended Changes or Comments

Users of this publication are encouraged to recommend changes and submit comments for its improvement. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared, using DA Form 2028 (Recommended Changes to Publications and Blank Forms), and forwarded direct to the Commandant, United States Army Command and General Staff College, ATTN: ATSW-ST, Fort Leavenworth, Kansas 66027.



CHAPTER 2

PRINCIPLES, RESPONSIBILITIES, AND ORGANIZATION (STANAG 2134)

Section I. PRINCIPLES OF AIRSPACE MANAGEMENT

2-1. General

a. Airspace management consists of the coordination, integration, and regulation of the use of airspace of defined dimensions. In this context, coordination is that degree of authority necessary to achieve effective, efficient, and flexible use of airspace. Integration considers the necessity to consolidate requirements for the use of this airspace in the interest of achieving a common objective at the lowest possible level. Regulation indicates the requirement to supervise activities in this airspace to provide for flight safety and connotes the authority required to insure such safety.

b. The maneuver force (corps, division) commander requires freedom of use of airspace immediately over his force for maximum flexibility to employ organic aircraft and weapons whenever land forces are committed to combat.

c. All service components have a requirement to operate in the low and medium altitude structure. Therefore, the use of airspace and altitude restrictions must be minimized. Requirements for airspace restrictions will be evaluated on a case-by-case basis; when

established, they will be temporary in nature and limited in space. Close liaison and coordination between all Service components/commanders must be established to insure an unimpeded flow of essential information concerning the use of airspace.

2-2. Objective

The objective of airspace management is to enhance the effectiveness of joint US Army-US Air Force combat operations by efficiently integrating the airspace operations of the joint force. In this context, airspace management over the combat zone entails four basic and indivisible tasks—air defense, air traffic regulation, tactical mission control, and certain aspects of fire support coordination. The guiding principle in the formulation of procedures to accomplish these tasks is the overriding requirement that they promote the ability of the fielded air and ground forces to attain the joint force objectives. In this regard, air defense and airspace management are interrelated and inseparable functions. Thus a coordinated and integrated system under a single authority is essential to achieve this principle.

Section II. AIRSPACE MANAGEMENT COMMAND RESPONSIBILITIES

2-3. Theater of Operations

a. In joint Army-Air Force operations, the Air Force component commander/commander, Air Force forces (AFCC/COMAFFOR) will be designated the area air defense commander and the area airspace management authority (AAMA). The area air defense commander is responsible for establishing coordinated air defense procedures and rules of engagement. The AAMA has responsibility for operation of the area airspace management system, as directed by the US unified or joint task force commander. The AAMA must have the capability to insure that friendly aircraft may enter, depart, or move within the area of operations without undue restrictions on their movements or without restricting the effectiveness of the joint force. In order to achieve this objective, most Army aircraft operations in the forward area will be

under procedural control rather than positive control, and indirect artillery and other fire support will be conducted with a minimum of restraint. The AAMA will be responsive to the needs of all airspace users to promote maximum efficiency in accomplishing the joint force mission.

b. The AAMA will coordinate, integrate, and regulate the use of airspace in an area of operations through the facilities of the airspace management system, making maximum use of the control elements and capabilities of all services. He also must coordinate and integrate the capabilities of the Army/Air Force airspace management system with any existing allied military, civil, national, or international air traffic control systems to effect unity of airspace management effort throughout the area of operations.

c. In addition to the above, the AAMA is responsible for establishing coordinated rules and procedures for airspace management to include:

- (1) Control points (restricted/sector airspace entry points, etc.).
- (2) Arrival, departure, en route, and handover procedures (minimum-risk passage).
- (3) In-flight reporting procedures.
- (4) Control of all air traffic operating under instrument flight rules/instrument meteorological conditions (IFR/IMC).
- (5) Coordination procedures for aircraft operating under visual flight rules/visual meteorological conditions (VFR/VMC).
- (6) Procedures for integrating air movement information produced by component command and control systems.
- (7) Establishment of an airway structure when required for air traffic control.
- (8) Establishment of temporary restricted altitudes and areas when required to meet joint force objectives.

2-4. Combat Zone

a. The commander of US Army combat forces (normally corps) is responsible for airspace management functions within his area of territorial responsibility, as defined in the coordinated rules and procedures established by the AAMA. The corps commander will establish an integrated airspace management system in the combat zone in coordination with other forces affected by his operations. To insure the success of this system, the commander should incorporate provisions for airspace management in all

operational planning. He is responsible for coordinating the operations of his forces with other Services and for the development of integrated rules and procedures for all Army activities involved in the use of airspace within his command. In addition, contingent procedures should be developed to insure continuity of operations in a degraded airspace management system. Chapter 3 discusses the corps airspace management system.

b. The maneuver unit (normally division, brigade, battalion) commander is responsible for coordinating his airspace activities when those activities may impact on other airspace users. In the vicinity of the line of contact, or the forward edge of the battle area, the maneuver battalion commander is responsible for minute-to-minute control/coordination of those airspace users directly supporting his operations. This combat support is provided in response to his requests and he must coordinate its application, both to maximize its effectiveness and to preclude mutual interference. Although there is normally no requirement for a special staff element at the maneuver brigade or battalion dedicated to airspace management, the commander routinely exercises control and coordination through his staff, supporting liaison/fire support representatives, and subordinate unit commanders.

c. Responsibility for compliance with the rules of flight, rules of engagement, and firing restrictions lies with all commanders/leaders and individuals in control of equipment or systems to which such rules or restrictions apply.

Section III. ARMY AIRSPACE MANAGEMENT ORGANIZATION

2-5. Basic Organizational Structure

The Army airspace management system must be flexible enough to be effective within any airspace organization that may be implemented in the field. The organizational structure shown in figure 2-1 is presented as an illustrative model within which various airspace user systems may be employed.

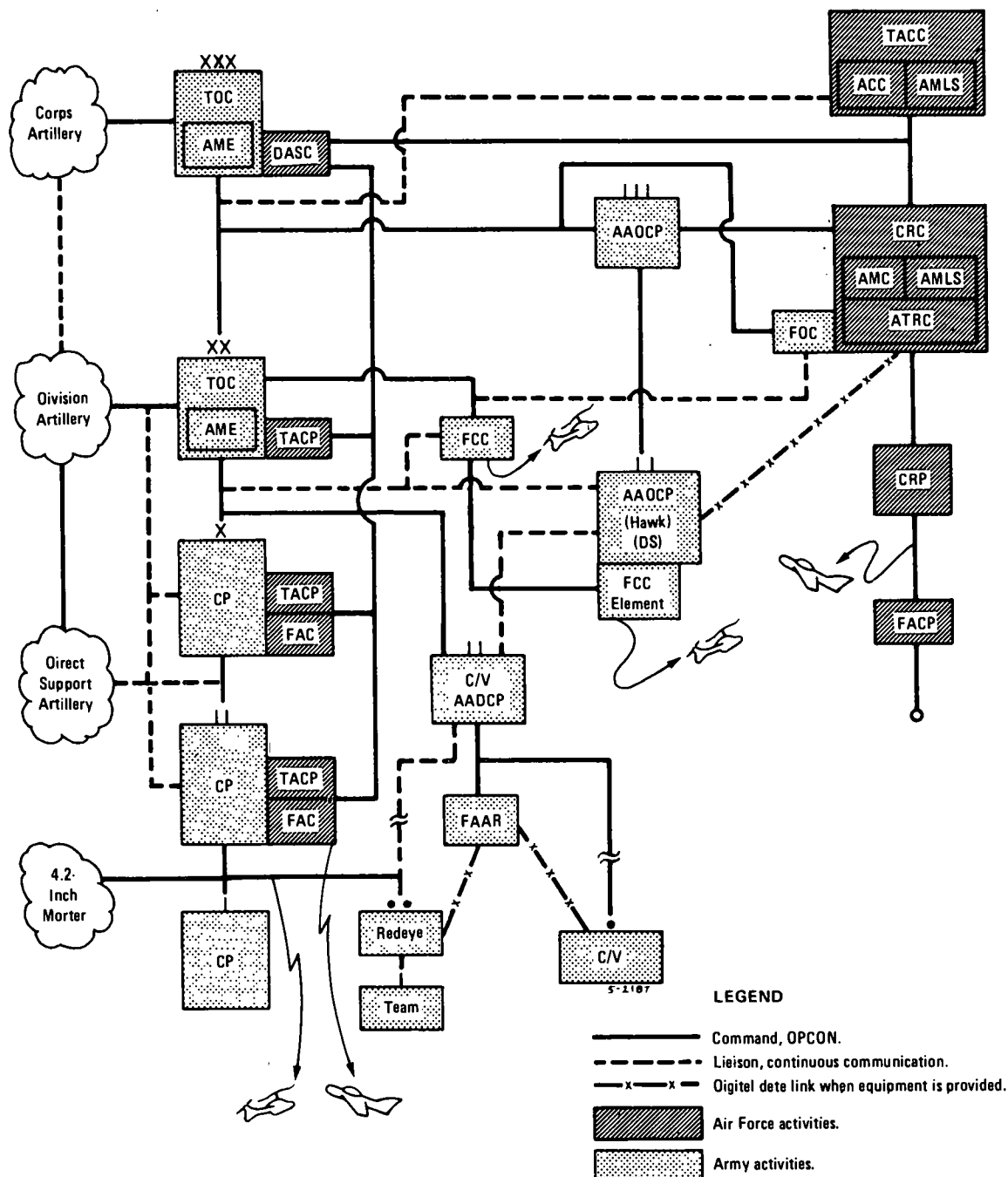
2-6. Elements

The elements that are included in an airspace management system are discussed in *a* through *e* below. Their functions are discussed in chapter 4.

a. *Airspace Management Element.* Current organizational manning provides for an airspace management element (AME) at division and corps level. The AME, normally composed of personnel from the air defense artillery and

aviation sections, serves as the commander's focal point for airspace management. The AME was formerly designated the airspace control element. The AME normally collocates with the tactical air support element and the fire support element in the tactical operations center. Recommended manning levels are listed in the tactical operations center appendix to FM 101-5.

b. *Airspace Management Liaison Section.* The airspace management liaison sections (AMLS) located at the tactical air control center and control and reporting center (CRC) provide the AAMA an agency for planning, coordinating, and integrating activities related to airspace management. The AMLS is staffed with representatives from all of the service components involved. Army representation to the AMLS at the tactical air control center will normally be



NOTE: Organizational structure shown represents Army-Air Force relationships with one corps deployed. Modification will be required for multicorps operations.

Figure 2-1. Illustrative airspace management system organizational structure.

provided by the senior Army commander. Army representatives to the AMLS at the CRC will normally be provided by the appropriate corps commander from aviation and air defense assets. The Army air defense requirement is met by the air defense artillery liaison currently provided to the CRC. Personnel selected to staff the AMLS must be intimately familiar with the airspace users' systems and requirements.

c. *Indirect Fire Support.* Indirect fire support units maintain a system of fire direction centers for internal fire control. Field artillery units provide the fire support coordination centers and the fire support element. The fire support element and fire support coordination center provide the command coordination of fire support on surface targets. Mortar units are directly controlled by maneuver unit commanders, but their fires should

be coordinated by the fire support coordination center.

d. Army Air Defense Artillery. Army air defense artillery operations are controlled by Army air defense command posts (AADCP). The AADCPs controlling the Hawk and Nike-Hercules weapon systems are supported by radars and semiautomatic command and control systems. The division air defense artillery battalion and nondivision Chaparral/Vulcan battalion AADCPs are manual and feature full decentralization of engagement authority for the Chaparral/Vulcan air defense artillery weapons. Control authority for Redeye and organic non-air-defense weapons capable of engaging aircraft rests with the using unit, subject to compliance with rules and procedures established by the area air defense commander.

e. Army Air Traffic Control Elements.

(1) A system of manual flight operations centers (FOC), flight coordination centers (FCC), approach/departure control facilities, airfield control towers, and navigational aids is provided throughout the corps area for the control and coordination of Army air traffic.

(2) Normally, a Hawk battalion will be placed in direct support of each committed division; Hawk battalions in the combat zone are normally retained under the command and control of the senior air defense headquarters assigned to the corps. When a Hawk battalion is in direct support of a division, the battalion radar capability may be exploited to provide air threat warning to the division, and to assist in providing air traffic advisory/assistance services to aircraft on an exception basis.

(3) Army pathfinder units (not shown in fig 2-1) provide navigational assistance and aircraft control services as necessary during any phase of an operation that requires sustained employment of Army aircraft. Pathfinders are normally used to select, improve, mark, and control landing/pickup/drop zones. They may also operate at forward helipads. The pathfinder facility maintains communications with aircraft and fire support units as necessary for control and coordination in the landing/pickup/drop zone area. Unit terminal guidance personnel may perform similar functions.

Section IV. AIR FORCE AIRSPACE MANAGEMENT ORGANIZATION

2-7. Basic Organizational Structure

The Air Force tactical air control system (TACS) begins at the Air Force component command level and extends through all operating echelons. It is a system of personnel, facilities, sensors, and communications through which the Air Force component commander plans, coordinates, and directs the resources available to him for the conduct of tactical air operations. This system provides the organization and equipment necessary to coordinate Air Force operations with other Service components. The various components of the TACS are shown in figure 2-2 and are described in paragraph 2-8.

2-8. Tactical Air Control System Components

a. Tactical Air Control Center. The tactical air control center serves as the control center of the TACS. The tactical air control center is dedicated and operationally responsive to the AFCC/COMAFFOR for airspace management, ground sensor surveillance systems, air support coordination and control, and airstrike coordination and control. Through the tactical air control center, the AFCC/COMAFFOR permits decentralized execution of air missions by subordinate TACS elements to promote mission effectiveness and enhance responsiveness. The

airspace coordination center is the element within the tactical air control center through which the AAMA coordinates and integrates the use of airspace in a combat zone. The airspace coordination center, which includes an AMLS, is responsible for—

(1) Formulating air traffic control policies, plans, and procedures.

(2) Coordinating air traffic control activities that complement planned tactical mission requirements.

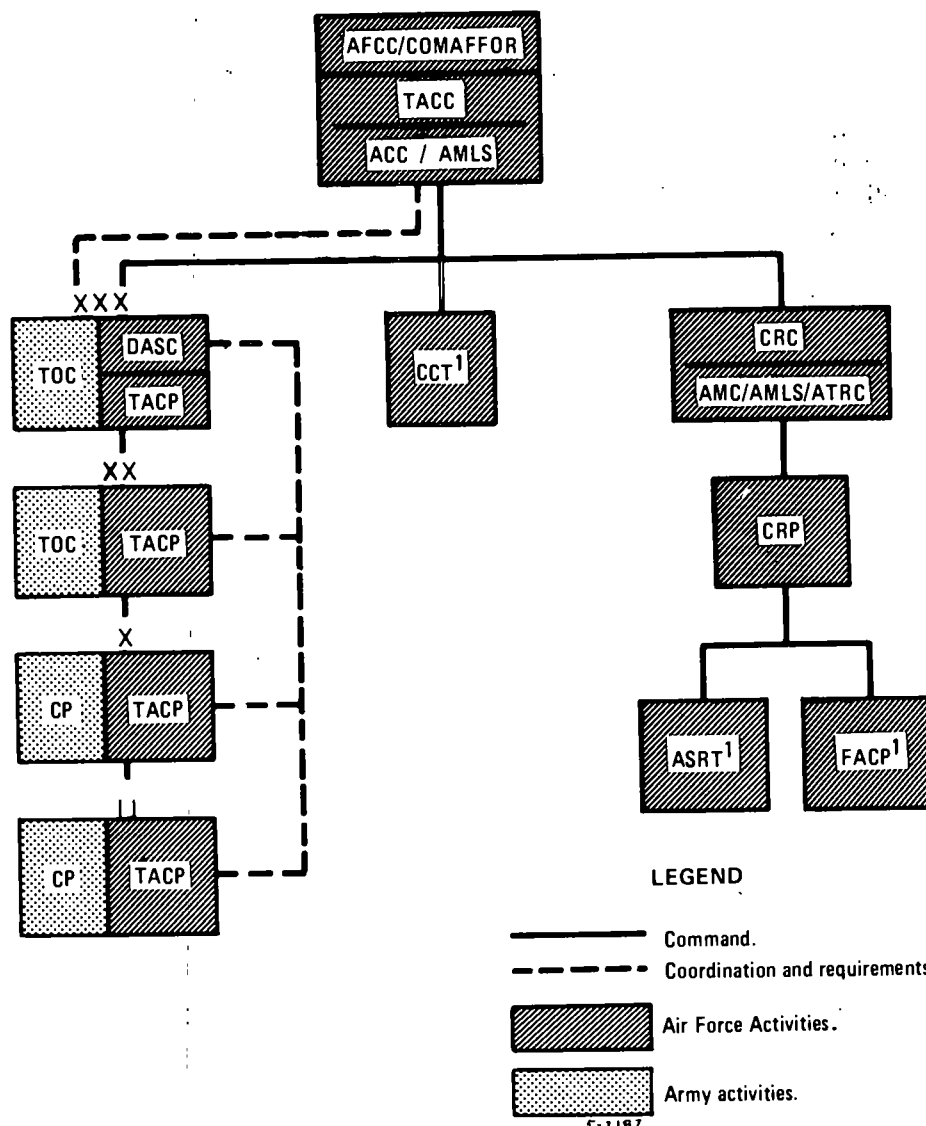
(3) Coordinating airspace utilization with adjacent air traffic control agencies.

(4) Insuring that air traffic control plans are compatible with current operational capabilities.

(5) Obtaining AMLS representation from the other service components.

(6) Evaluating requests for and establishing temporary restricted areas.

b. Control and Reporting Center. The CRC is an element of the TACS. It conducts radar control and warning operations within its area of responsibility. The CRC supervises the activities of subordinate radar units and collects, displays, evaluates, and disseminates information on air activities throughout the TACS. The CRC provides defensive and offensive mission control, navigational and air rescue assistance for friendly



¹ Employed when operational or tactical requirements dictate.

Figure 2-2. Components of the Air Force tactical air control system.

aircraft, and threat warning for friendly forces. The CRC provides the means for air traffic regulation and identification and is the primary airspace management agency in the airspace management area/sector. The airspace management center, which includes an AMLS, is an element within the CRC. The airspace management center functions in response to airspace/air traffic requirements as an integral part of the area airspace management system. It is established to control, coordinate, regulate, and identify air traffic operating in an assigned airspace management area/sector. The airspace management center provides continuous cross coordination, regulation, and integration of the component services' air operations in accordance with the coordinated rules and procedures established by the airspace coordination center.

Essential to this function is the coordination of airspace use data between the airspace management center and appropriate air traffic control/airspace management facilities.

c. *Air Traffic Regulation Center.* Air traffic regulation and identification is effected by the use of an air traffic regulation center. The air traffic regulation center is an integral part of the CRC and regulates the flow of air operations under the operational control of the tactical air control center. The air traffic regulation center coordinates closely with Army and other air traffic control agencies.

d. *Control and Reporting Post.* The control and reporting post (CRP) augments the CRC by extending radar surveillance and control capabilities. A CRP may assume the primary functions of a CRC (including the airspace

management center function) on a limited basis.

e. Forward Air Control Post. The forward air control post is a subordinate facility of the CRC or CRP and consists of lightweight surveillance and control radar to extend system coverage, fill gaps, and provide limited extension of control capability. The forward air control post functions as an airspace management facility in an airspace management sector.

f. Direct Air Support Center. The direct air support center is a mobile, air-transportable facility designed to operate with a corps tactical operations center or an independent division tactical operations center. The primary task of the direct air support center is to provide a fast-reaction capability to satisfy immediate requests from Army forces for tactical air support.

g. Tactical Air Control Party. The tactical air control party is a forward operations element of the TACS and is attached to each cavalry squadron, maneuver battalion, brigade, regiment, separate brigade, division, and corps. The tactical air control party advises the associated ground commander and staff elements on all aspects of tactical air support operations,

forwards immediate requests, and coordinates and controls tactical air support furnished to Army forces.

h. Forward Air Controller. The forward air controller, assigned to a tactical air control party and in support of a maneuver force, will control visual flights when employed in close air support strikes. Control may be exercised from airborne or ground observation posts. Whether airborne or on the ground, the forward air controller will maintain contact with both the strike pilot and the appropriate fire support coordinator.

i. Combat Control Team. The combat control team provides limited weather observations, installs and operates necessary navigational aids and communication equipment, and controls air traffic in an airhead area until mobile tactical control elements are in place.

j. Air Support Radar Team. The air support radar team is a mobile unit equipped with precision radar to provide all-weather guidance to tactical strike aircraft in an attack against ground targets. It may also be used to position reconnaissance and tactical airlift aircraft over predetermined locations.

CHAPTER 3

CORPS AIRSPACE MANAGEMENT SYSTEM

Section I. INTRODUCTION

3-1. The Corps

a. The corps is the Army's principal force in a theater of operations and it has both tactical and administrative responsibilities. It may consist of two to five divisions and the combat support and combat service support essential to sustain the force. The corps commander establishes command relationships within the corps.

b. The corps will be assigned territorial responsibilities, normally in the combat zone, that entail the allocation of ground space to all using forces to include other Services and allies when appropriate.

3-2. Authority of the Area Airspace Management Authority

The authority of the area airspace management authority (AAMA) extends over the airspace of the entire combat zone. He exercises his authority by coordination with other Service commanders and through the promulgation of rules and procedures for the coordinated and integrated use of airspace over the combat zone. The coordination with the Services concerned for the use of airspace in the combat zone will be facilitated through collocation of key activities involved. Where this is not practicable, such activities will be electronically connected and liaison established.

Section II. AIRSPACE MANAGEMENT AREA

3-3. General

a. Managed airspace is airspace of defined dimensions in which airspace management is provided. The airspace management area is managed airspace literally defined by the boundaries of the area of operations. The AAMA will normally subdivide the airspace management area into sectors that are compatible with the air defense organization subdivisions. The number of sectors will vary depending on the combat situation; the geographical factors; and the complexities of air traffic control, airspace management, and air defense requirements. The AAMA designates the sector airspace management authorities and their areas of responsibility. They manage their sectors through a sector airspace management facility.

b. In the combat zone the sector airspace management facility will normally be an Air Force control and reporting center (CRC). An airspace management liaison section (AMLS), with representatives from all Service components involved, will be provided to the sector airspace management authority.

3-4. Corps—Control and Reporting Center Interface

a. The process of coordinating corps airspace

activities with other Service components involved will be accomplished through the AMLS as prescribed by the AAMA. The corps representative to the AMLS will be responsible for coordinating corps requirements to operate aircraft and/or weapon systems within the airspace over the corps and for coordinating corps requirements for the performance of the corps assigned mission.

b. Air defense artillery and Air Force operations are coordinated to prevent mutual interference, to exchange intelligence information, and to insure the safety of friendly aircraft from air defense artillery fires. In addition, air defense artillery liaison and communications are established between the CRC and the corps air defense artillery group Army air defense command post (AADCP).

c. The corps flight operations center (FOC) is collocated with or electronically connected to the CRC. When the FOC is physically separated from the CRC, the Air Force will furnish communications for connecting the two facilities. The FOC serves as the primary interface with the CRC in the control of Army air traffic when this traffic comes under the purview of the FOC.

Section III. AIRSPACE MANAGEMENT AIDS AND RESTRICTIONS

3-5. Tactical and Rear Operations Areas

a. In devising procedures for airspace management in the combat zone, two distinct areas are recognized. These are the tactical operations area and the rear operations area. These areas have air traffic flows that dictate unique management procedures.

b. The tactical operations area is that area between the fire support coordination line and the rear operations area. The boundary between the tactical and rear operations areas will normally be the divisions' rear boundaries. The tactical operations area is that area where maximum flexibility of airspace users is needed to insure mission accomplishment. Restrictions and constraints will be kept to an absolute minimum and applied only when necessary. Freedom of movement by Army aircraft in random directions based on mission requirements throughout this area is necessary. The required flexibility and potential density of traffic make individual reporting neither feasible nor desirable. However, the coordination of information reflecting the intensity of weapons and aviation activity in the tactical operations area is an important airspace management function.

c. The rear operations area is that area from the rear of the tactical operations area to the corps rear boundary. In this area the enemy threat is reduced and airspace management is more definitive. Army air traffic movements will normally be predominantly along an axis perpendicular to the forward edge of the battle area and in transit between the forward and rear areas. In recognition of the more regulated and predictable traffic flow in the rear operations area, air traffic control can be described as being more formal with both the Army and the Air Force air traffic control systems being integrated to the degree possible.

3-6. Coordinating Altitude

a. A coordinating altitude over the combat zone will normally be designated by the AAMA in coordination with the Services involved. It is an altitude below which Air Force activity must be coordinated with the appropriate Army facilities and above which Army aircraft activity must be coordinated with Air Force tactical air control system (TACS) elements. Coordinated procedures and general operating rules will be established that do not require approval or clearance for each flight of aircraft through the coordinating altitude.

b. The coordinating altitude assigned to the Army may be below the coordinating altitude assigned to the Air Force if a buffer zone between Army and Air Force air traffic is desired. The requirement for coordination when penetrating the coordinating altitude does not deny use to either Army or Air Force users; rather, it is a procedure to insure that air traffic information is provided to the airspace management agencies that need it to plan and conduct effective combat operations.

c. The height of the coordinating altitude will be based on the tactical situation, mission requirements, and capabilities of the Services involved. Corps requirements for changes in the coordinating altitude will be provided to the AAMA through the AMLS at either the tactical air control center or the CRC for approval.

3-7. Minimum Risk Routes

a. Minimum risk routes (MRR) are temporary routes of flight, intended for Air Force use, over the tactical operations area presenting the minimum known hazards to low-flying aircraft. The AAMA will establish Air Force requirements for MRR through the tactical operations area and will request the corps to provide recommended MRR to the appropriate TACS element. The actual route of flight used by Air Force low-flying aircraft to transit the tactical operations area may, or may not, be along an MRR recommended by the corps.

b. The corps recommended MRR will be established through the tactical operations area. As a minimum, the following factors will be considered in the development and selection of recommended MRR:

- (1) Security against compromise.
- (2) Indirect and air defense firing battery locations.
- (3) Air defense weapon control statuses.
- (4) Ground maneuver and fire support planning.
- (5) Terrain.
- (6) Known enemy indirect and air defense fire capabilities.
- (7) Areas of significant Army aviation and airborne activity.

3-8. Restricted Altitudes and Areas

a. Restricted altitudes are levels above mean sea level or above ground level that delineate the upper and/or lower limits of restricted areas. A restricted area is defined as an area (land, sea, or

air) in which there are special restrictive measures employed to prevent or to minimize interference between friendly forces. These altitudes and areas are designated by the AAMA for a limited period to accomplish a specific military mission.

b. Corps requirements to establish restricted areas in the combat zone will be provided to the

AAMA for approval through the AMLS at either the tactical air control center or the CRC. Use of the airspace contained within restricted areas will be limited to those activities designated by the maneuver force commander for whom the restricted area was established.

Section IV. CORPS AIRSPACE MANAGEMENT SYSTEM

3-9. General

a. The corps airspace management system incorporates the activities of all Army elements involved in the management of airspace over the combat zone. It must provide for the coordinated use of airspace by combat, combat support, and combat service support units. It also provides for the effective use of airspace in support of the corps assigned mission and is based on the commander's guidance and the broad rules and procedures established by the AAMA.

b. The corps/division air defense officer, aviation officer, fire support coordinator, and other staff members under the supervision of the G3, plan for the coordinated, integrated, and regulated use of airspace in the combat zone. Airspace management rules and procedures are established and issued to all major subordinate units affected. These rules and procedures must allow subordinate units the degree of flexibility required to support their operations.

c. The corps and division tactical operations centers are the command installations in which necessary personnel and communication facilities are centralized to control and coordinate current tactical operations. Within a tactical operations center are located the elements necessary to coordinate all planned airspace management functions. To facilitate the exchange of essential information affecting the management of airspace, the G3 should insure that sufficient space is provided in the tactical operations center for collocation of the airspace management element (AME) with the fire support element and the tactical air support element.

3-10. Airspace Management Element

a. The AMEs at corps and division levels are under the staff supervision of their respective G3 and serve as focal points for airspace management and coordination with adjacent, higher, and lower headquarters. The AME continually receives and disseminates information, data, and requirements essential to the management of airspace to the AMLS, fire support element, tactical air support element, aviation and air defense officers, G2 and

G3 elements, liaison personnel, and Army air traffic control unit elements. This list of personnel and elements should not be construed as limiting the AME's sources of information. The AME must continually coordinate with any agency that is able to provide information concerning the use of airspace in the combat zone.

b. The AME is a manual planning and management element and has limited information-handling capabilities. The resolution of potential airspace user conflicts is normally accomplished by plans and SOP. When conflicts arise that are not covered by plans and SOP, they are resolved by using the principle of management by exception. It is important that conflicts be resolved at the lowest possible level having the requirement and capability.

3-11. Army Air Defense

a. The dominant Army air defense weapons in the rear areas are Hawk and Nike-Hercules. Engagements by these weapons can be under either centralized or decentralized direction, whereas the divisional air defense weapons must operate under decentralized engagement authority. The same rules of engagement apply to all air defense artillery weapons. Hostile criteria to implement the rules are drawn from the theater-listed criteria. Some criteria are designed for use only by the radar-directed Hawk and Nike-Hercules weapons.

b. Engagement authority for divisional air defense weapons is normally decentralized to the fire unit level on the basis of division SOP and command direction. The division SOP must be compatible with the area air defense commander's published rules and procedures. Application of weapon controls, in accordance with the commander's analysis of the air situation and the theater air defense rules, contributes to effective airspace management.

3-12. Army Aviation

a. Army air traffic operations in the combat zone are conducted in accordance with the rules and procedures established by the corps and

division commanders. Coordination of Army aviation operations is normally accomplished between affected commanders using established operational channels.

b. Army air traffic is less dense in the rear operations area and, for the most part, may be considered to be preplanned. Requirements for terrain flying* to avoid enemy detection are less severe, thus simplifying air traffic regulation. Coordination with other aerial activity is mainly a terminal and handover problem because combat operations are not usually in progress in the rear areas. Air traffic density in the rear operations area will increase during stability and counterguerrilla operations and enemy air operations. Adequate control is required to preclude degradation of Army aviation combat operations originating from the rear or conducted in rear areas.

c. Army air traffic in the tactical operations area must have maximum flexibility to respond to the ground commander's operational needs. Controls and restrictions will be minimized, and coordination will be based primarily on SOP. Normally there is no requirement for air traffic control elements to be in constant contact with all aircraft in the tactical operations area. The primary method of conflict avoidance rests with the operator and his ability to see and be seen.

3-13. Indirect Fire Support

a. The Army command and control system does not possess the capability to collect, categorize, and disseminate timely artillery

information with respect to intensity, duration, location, and maximum ordinate of friendly fires throughout the entire tactical area of operations. The highest probabilities of conflict between aircraft and indirectly delivered supporting fires occur at relatively low altitudes in the immediate vicinity of firing unit locations and target impact areas. With the exception of these two areas the probability of conflict between aircraft and indirect fires is relatively low. Indirect fires will not normally be interrupted because of potential conflict with aircraft traffic.

b. Consistent with mission requirements, tactical aircraft will avoid areas of high-risk indirect-fire conflict. Conversely, high-priority tactical aircraft missions will not be delayed because of potential conflicts with indirect fire support.

c. Coordination of indirect fire support with other airspace activities should be effected to the maximum extent possible consistent with mission objectives and systems' capabilities. To reduce the potential risk of conflict posed by significant concentrations of preplanned indirect fires and aircraft, the requirement exists for coordination of information pertaining to indirect fire support activity with the applicable airspace management facilities. Coordination procedures must be based primarily on preestablished fire plans and fire unit locations, updated to the maximum extent possible and consistent with Army artillery system capabilities and airspace management requirements.

Section V. OTHER CONSIDERATIONS

3-14. Electronic Warfare

Modern military forces depend increasingly on electronic devices for the command and control of forces and the employment of weapons. Aircraft navigation systems, air-to-ground missile guidance systems, variable time fuzes, and communication and noncommunication emitters are lucrative targets for electronic warfare. The commander must insure that airspace management planning considers the application of electronic countermeasures such as jamming and deception to reduce the effectiveness of enemy surveillance and fire control equipment

and electronic counter-countermeasures (to include antenna relocation and operating emitters at low power) to degrade enemy electronic warfare activities. (For detailed actions, see FM 100-32 and FM 32-20.) Resources for electronic warfare support measures can be utilized to provide positive identification and location of enemy emitters and units. Of primary importance to airspace management is the requirement for close coordination between air and ground elements to insure that electronic countermeasure operations, particularly jamming, do not interfere with the airspace management system.

**Terrain flying* is defined as the tactic of employing aircraft in such a manner as to utilize the terrain, vegetation, and manmade objects to degrade the enemy's ability to visually, optically, or electronically detect or locate the aircraft. This tactic involves a constant awareness of the capabilities and position of the enemy weapons and detection means in relation to available masking terrain features and flight routes. Terrain flying of necessity involves flight close to the earth's surface and includes tactical application of low-level, contour, and nap-of-the-earth flight techniques.

3-15. Enemy Air Defense Suppression

The enemy air defense threat in the corps area of influence is a vital consideration in airspace management planning. Since the suppression of enemy air defense systems is a matter of joint Service concern, the entire intelligence community must strive to obtain detailed intelligence and to provide mutual exchanges of threat data through established communication

channels and coordination procedures. Measures to suppress enemy air defense are aimed at detecting the air defense systems and neutralizing or destroying them to preclude their effective use. Airspace management planning designates enemy air defense threat areas, recommends suppression measures, and recommends specific MRR to avoid known threat area.



CHAPTER 4

AIRSPACE MANAGEMENT PROCEDURES

Section I. INTRODUCTION

4-1. General

a. The principles of and organization for airspace management in the combat zone are the same for the divisions and corps. However, the types and densities of airspace user activities differ between the division area and the corps rear area.

b. The procedures discussed in this chapter are generally applicable at both the corps and division levels. These procedures are intended for use during time of war and, therefore, must be augmented as necessary to provide for peacetime safety requirements. Sample division and corps SOP contained in appendixes B and C serve to illustrate the implementation of these procedures.

4-2. Airspace Conflict Resolution

a. Normal operational planning and execution and adherence to SOP should prevent most conflicts between airspace users; however, exceptions must be resolved on the spot. The maneuver unit commander must establish priorities for the use of airspace. These serve as the guidelines for resolution of conflicts by the airspace coordinators and users. Initial priorities are published in SOP and operation orders with subsequent changes disseminated as necessary. If a conflict cannot be resolved by established priorities, the commander will be advised of the conflict. The commander's decision, which will vary with the mission, enemy capabilities, and support requirements, will then be passed to the elements concerned. When time or circumstances do not permit SOP or command resolution of conflicts, conflict situations presenting immediate safety hazards to friendly forces will be resolved by the coordinator/controller detecting the conflict.

b. The following policies relating to airspace management should be incorporated in plans and SOP:

(1) A selected representative may be designated and given authority to assign airspace priorities for the commander at brigade and battalion levels.

(2) The commander or his designated representative will approve use of airspace in

support of preplanned operations.

(3) Subordinate unit commanders, as well as coordinators, controllers, and operators, will be given authority to make on-the-spot adjustments in airspace operations to preclude unnecessary hazards to friendly forces.

(4) Control rules and procedures, delineation of detailed responsibilities, and communication instructions will be provided in SOP and plans and exercised in the field prior to hostilities.

4-3. Coordination With Other Services

a. To effectively arrange for airspace management in the combat zone, airspace management facilities must have a capability for air traffic identification and control and for receipt and dissemination of information and requirements concerning the use of airspace. For priority missions involving the use of airspace, coordination is required between airspace management facilities and command and control elements to prevent unnecessary disruption of other activities.

b. Each Service component within a joint force has requirements to operate aerial vehicles and weapon systems within the airspace in an area of operations in the performance of its assigned mission. The coordination and integration of component Services' flight operations and fire support activities, within the area of responsibility of the area airspace management authority (AAMA), will be accomplished through the airspace management liaison section (AMLS). The AMLS serves as the primary agency for the coordination and integration of approved flight operations and air warning information among other Service components.

c. Army liaison personnel at the AMLS are the corps commander's representatives responsible for the coordination and integration of Army airspace user requirements with those of other Service components. Additionally, Army representatives at the AMLS will—

(1) Provide other Service components with information concerning Army airspace requirements (e.g., restricted areas, coordinating altitudes, airmobile assaults, significant artillery

concentrations, air defense weapons free zones).

(2) Inform the appropriate Army element of other Service operations that may affect ground operations.

(3) Arrange for standard use Army aircraft routes in the rear operations area. The corps airspace management element (AME) (also referred to as CAME) will determine corps requirements for such routes.

(4) Arrange for the integration of Army air traffic control facilities with tactical air control system (TACS) elements.

(5) Provide Army recommended minimum risk routes (MRR) to the tactical air control center or the control and reporting center (CRC). The AMLS obtains these recommended MRRs from the CAME.

d. Airspace management control measures and

aids will be designated, coordinated, and integrated with other Services to maximize the responsiveness of all users while limiting the requirements to perform on-the-spot resolutions. Examples of some control measures and aids are listed below:

- (1) Minimum risk routes.
- (2) Coordinating altitudes.
- (3) Radar and electronic navigational aids.
- (4) Air defense rules and procedures.
- (5) Corridors.
- (6) Communication systems.
- (7) Restricted areas.
- (8) Air traffic rules and procedures for instrument meteorological conditions (IMC) and visual meteorological conditions (VMC).
- (9) Number of aircraft constituting a multiple flight.

Section II. AIRSPACE MANAGEMENT ELEMENT PROCEDURES

4-4. General

a. The AME, under G3 supervision, is the commander's focal point for airspace management. The AME activities are conducted in compliance with higher headquarters' directions and the commander's concepts. The primary purpose of the AME is to coordinate all airspace management functions among Army airspace users and with other Services. The AME has five basic functions: It—coordinates the use of airspace, coordinates Army air defense artillery operations, coordinates Army air traffic, provides information on aviation status and recommends the allocation and reallocation of Army aviation resources, and provides intelligence obtained through air defense channels.

b. Determination of the ultimate manning of the AME and its functions is a command prerogative. As a minimum, manning should include an air defense artillery officer, an aviation officer, and supporting operations and clerical personnel. The AME should be capable of conducting 24-hour operations. Recommended manning is also discussed for the airspace control element in FM 101-5.

c. The procedures discussed below apply in varying degrees to the AME at corps and division levels. User activities and requirements differ between the division area and corps rear area and, in this respect, the functions of the AME will differ accordingly.

4-5. Coordinating the Use of Airspace

a. *Multiple Army Aircraft Flights.* The corps G3 may determine the number of aircraft that

constitutes a multiple Army aircraft flight based on the enemy helicopter threat. This number will be coordinated through channels with the area air defense commander and designated in the airspace utilization annex to the division/corps operation plans or orders or prescribed in the SOP. Any helicopter formation flight that exceeds the designated number may be engaged under current rules of engagement unless it is under positive control and its passage has been coordinated with air defense forces. This procedure, in conjunction with visual recognition, will expedite positive identifications by air defense units.

b. *The Airspace Management Element.* The AME, in conjunction with the fire support element and the tactical air support element, determines how airspace requirements for a planned operation can best be met, then submits recommendations to the G3 for approval and issues necessary instructions. The AME normally prepares the airspace utilization annex to operation plans/orders and maintains airspace utilization displays. Typical displays combine Army air defense, Army and Air Force air support, and indirect fire support information to the maximum degree feasible. The AME displays airspace utilization information regarding planned and ongoing air activity for those areas where it has airspace management responsibilities. Data are maintained on air traffic control facilities and on standing and temporary regulatory or restrictive measures.

c. *Army Aviation Airspace Operations.* The AME performs airspace management plan-

ning/coordination for multiple Army aircraft flights and significant Army aviation activities. Other aircraft flights are handled as feasible. If conflicts occur in the planned use of airspace, the AME, in conjunction with the tactical air support element, fire support element, or any other element initiating the action, attempts to resolve the problem. Conflicts that cannot be resolved in accordance with command guidance, orders, and SOP are forwarded to the G3. Airspace management information will be disseminated to the initiator of the action and to appropriate management agencies as follows:

(1) From the AME to the appropriate flight operations center/flight coordination center (FOC/FCC).

(2) From the AME to the brigade command post.

(3) From the FOC/FCC and brigade command post to all elements concerned.

d. Other Service Airspace Operations. The tactical air support element (or other action initiator) and AME coordinate continually to avoid airspace conflicts between the services. Coordination is as in *c* above with the understanding that all other service activities are coordinated. The coordinating altitude affects air traffic regulatory operations and may reduce, but does not eliminate, the requirement for coordination by the AME and the action initiators. On request, the AME will provide recommended MRR to the AMLS at either the tactical air control center or the CRC.

4-6. Coordination of Air Defense Artillery

a. The AME maintains continuous estimates of the air defense situation and represents the air defense officer in preparing recommendations for changes in the allocation and employment of Army air defense means. The AME provides information on the air defense situation, including air defense coverage, to other tactical operations center elements. Periodic and spot reports from air defense artillery units allow the AME to remain abreast of the air defense situation. When specific details are required, the AME requests the information from the appropriate air defense artillery unit headquarters. Information about the number of operational air defense weapons and their deployment is provided from the air defense artillery battalion Army air defense command post (AADCP) to the air defense section of the AME. Redeye information, in summary form, is received from the brigades, field artillery battalions, and cavalry squadrons.

b. The AME assists the commander in

regulating air defense weapon fires and preventing undue interference with other operations by advising on the air defense weapon control status and by recommending changes to the SOP for air defense operations. Weapon control status changes may be initiated by higher Army headquarters or the area air defense commander, or they may be recommended by the AME. A less restrictive measure than that approved by the area air defense commander must not be ordered. Dissemination authority is as specified by SOP.

4-7. Coordination of Army Aviation

a. The AME maintains continuous estimates of the aviation situation and represents the division aviation officer in preparing recommendations for changes in the allocation and employment of aviation means. The AME provides information to other tactical operations center elements on aviation resources controlled by or available to the corps/division. Reports from aviation units keep the AME abreast of the aviation situation.

b. The AME regulates Army air traffic by promulgating information on restricted areas and other restrictions imposed on air traffic by the commander or higher headquarters. On the basis of these restrictions, the AME disseminates aviation control guidance (corridors, altitudes, areas in which all flights must be cleared) and provides information for the preparation of the air route overlay to be included in the airspace utilization annex. On approval by the G3, the AME disseminates the plan to the tactical operations center, the direct air support center, and the Army aviation and air defense units as required. Through close coordination with other tactical operations center elements, the AME determines which combat and combat support activities will influence air traffic, and disseminates changes to the airspace utilization annex.

c. The CAME will determine corps requirements for standard use Army aircraft routes in the rear operations area. The route requirements will be provided to the AMLS at the CRC for coordination. The purpose of standard use Army routes is to assist in the regulation of Army air traffic habitually flying en route between facilities, airfields, or designated points in the rear operations area.

d. Information about the number of available Army aircraft and their deployment is provided by the aviation units to the aviation section of the AME.

4-8. Coordination of Fire Support

a. Field artillery fire plans, firing battery locations, and significant intensities of fire are provided to the AME by the fire support element. The intensity, duration, and location of indirect fire support are tied to the tactical situation and are not generally predictable. The reporting of detailed fire support data may not be timely or usable. The fire support element, tactical air support element, and AME coordinate to the extent practicable to preclude airspace conflicts between indirect fires and air support operations. Indirect fire support that cannot be coordinated at division level will normally be coordinated to the extent practicable by the lower echelon maneuver commander and his fire support coordinator.

b. Tactical air support information is disseminated from the tactical air support element to the AME. The tactical air support

element provides preplanned and immediate close air support information as missions are requested and performs airspace coordination with the AME as part of the coordination/approval process. Tactical air support provided the maneuver force is coordinated by the maneuver commander and the tactical air control party.

4-9. Coordination of Air Defense Intelligence

Air defense intelligence (hostile air activity data) obtained through air defense channels is provided by the AME to other elements of the tactical operations center. The air defense section of the AME receives intelligence information from the division AADCP and the division air defense artillery battalion liaison officer located at the Hawk battalion AADCP. This information is furnished to the G2, G3, tactical air support element, and fire support element, as appropriate.

Section III. ARMY AIR DEFENSE PROCEDURES

4-10. General

a. Air defense artillery fires are controlled to insure efficient engagement of hostile aircraft, prevent engagement of friendly aircraft, prevent air defense artillery and aviation mission interference, and prevent incidents prior to an outbreak of hostilities. The control procedures discussed in this section assist the commander in coordinating Army air defense operations with other airspace user activities. These control measures should be supplemented by corps and division SOP to provide for the alerting of air defense fire units of all Air Force and multiple Army aircraft flights approaching their locations. This alerting augments the data provided by the forward area alerting radar (FAAR). The FAAR mission gives priority to alerting information on aircraft tentatively identified as hostile.

b. Non-air-defense weapons will be employed by unit leaders/commanders in accordance with current orders and SOP. All weapons may be used in exercising the individual and collective right of self-defense against hostile attacking aircraft. Engagement of other hostile aircraft will be on orders issued through the unit chain of command.

c. Air defense unit command posts and the force G2/S2 have the basic responsibility for disseminating information regarding hostile aerial activity.

fires of his organic air defense weapons. These are—

a. *Weapons Tight. Fire only at aircraft positively identified as hostile in accordance with the announced hostile identification criteria.* Through careful selection of hostile criteria, this status will provide an effective safety balance to meet most needs.

b. *Weapons Free. Fire at any aircraft not identified as friendly.* Under this status, hostile aircraft and aircraft of unknown or doubtful identification may be engaged. Weapons free may be initiated by the joint commander when no friendly aircraft are in the area or when he is willing to accept some risk to friendly aviation in the face of an overriding requirement for air defense of his forces. Subordinate commanders may establish a more restrictive weapons control status. Joint air defense rules and corps/division policy will specify the levels of command authorized to permit weapons-free operations.

c. *Weapons Hold. Do not fire.* The right of self-defense against direct air attack is not denied in peace or war. This right permits engagement of aircraft actually delivering ordnance against the air defense fire unit and friendly units in the immediate vicinity, but precludes engagement of all other aircraft regardless of their actions, identity, or apparent intent. This status should be applied selectively with time and area limits, because it is intended to "turn off" the air defense capability. This rule may be used when the

4-11. Weapon Control Status

The three standard weapon control statuses are the commander's primary tools for control of the

commander desires absolute insurance against friendly air defense fires in the area of major friendly air operations. Any force commander employing air defense weapons is authorized to impose weapons hold on these weapons.

4-12. Hostile Criteria

a. The area air defense commander will publish air defense hostile criteria for use in the combat zone. Hostile criteria suitable for use by the visually directed air defense weapons and reflecting the commander's assessment of his air situation and the air threat must be selected from the published theater hostile criteria and placed in SOP. Selection of hostile criteria will be made by the air defense officer, in coordination with representatives of other airspace users, and recommended to the G3. If the published theater criteria are inadequate for use by the corps and divisions, corrective action will be recommended through command channels. The hostile criteria will form the basis for air defense gunner engagement decisions and will also inform pilots how to avoid acts that may result in a hostile classification. Accordingly, the hostile criteria will be disseminated as binding rules for all airspace users, and channels/authority for changes thereto will be specified. A sample listing of hostile criteria is discussed in FM 44-1.

b. Table 4-1 provides examples of hostile criteria for weapons tight operations in two air threat situations—major and minor helicopter threat. The criteria do not apply under weapons hold status. The determination of "major" versus "minor" helicopter threat is a theater-level function, based on the joint force commander's appreciation of the risks involved. His decision is expressed in the approved rules of engagement and hostile criteria. As an example, if the theater commander determines that a hostile force's capability to employ helicopters poses a "minor" threat in the theater, then under the published hostile criteria (table 4-1), the "discharging of parachutists without coordination" is not considered a hostile act under weapons tight status; therefore, the helicopter will not be engaged.

Table 4-1. Examples of Hostile Criteria—
Major and Minor Helicopter Threat

Hostile criteria ¹	Helicopter threat	
	Major	Minor
Helicopter considered hostile if—		
Attacking friendly elements ²	Yes	Yes
Bearing insignia/configuration of enemy aircraft	Yes	No
Discharging smoke and spray without coordination	Yes	No
Discharging parachutists without coordination	Yes	No
Improperly entering restricted areas	Yes	No
Unloading troops without coordination and bearing insignia/configuration of enemy aircraft	Yes	Yes

¹ Each alone is sufficient evidence to warrant a hostile identification.

² This is more than simple "self defense."

4-13. Procedures for Change

a. At corps and division levels, the SOP should define procedures for changing air defense control measures. Commanders will direct changes as the situation warrants. The AME may recommend changes to the G3, or the G3 or AME may receive emergency changes from joint air defense or higher Army echelons. The AME must be ready to receive emergency changes in weapon control status and disseminate these immediately to all units concerned. This requires that the authority and procedures to make the weapon control status either more or less restrictive be clearly specified in the SOP. Disseminations, when authorized, will be made from the AME through the chain of command or, in an emergency, by any available broadcast means.

b. From subordinate echelons, all users of organic/attached air defense means control their own weapons, subject to limitations of corps and division SOP. If the authority to declare weapons free is delegated to the division, the authority is not normally delegated below division. Nor are the subordinate echelons normally allowed to countermand a division-ordered weapons hold. The right of self defense is not denied.

Section IV. ARMY AIR TRAFFIC OPERATIONS

4-14. General

a. The AAMA will effect agreement with airspace management authorities in adjoining areas on procedures for coordination of flight information, clearances of aircraft to enter and depart the area of operations, and transfer of

control of flights. In addition, the AAMA will establish broad coordinated rules and procedures for air traffic regulation.

b. The procedures employed in performing air traffic identification and control functions in the combat zone will vary from the surveillance and

advisory aspects of a monitoring service to one of positive air traffic separation provided under the concept of positive control. Recognizing that positive control of all air traffic in the combat zone is not possible, the objective of airspace management is to provide, as a minimum, flight following service to all flights conducted in instrument flight conditions and to those flights conducted in visual flight conditions that will cross an airspace control line or air traffic control line. An airspace control line delineates the lateral boundaries of an airspace management sector and will not normally segment major Army unit areas of ground force responsibility. The air traffic control line is a line established forward of the forward edge of the battle area along prominent terrain features readily identifiable by observers from the air and ground. Normally the air traffic control line is located at or forward of the fire support coordination line.

4-15. Air Traffic Regulation

a. Aircraft movement within an area of operations may be conducted under instrument flight rules (IFR) or visual flight rules (VFR), depending on mission requirements and system capability. The corps commander may establish the criteria on which corps assigned aircraft will be considered under IFR or VFR. However, aircrews of all service components will endeavor to comply with the control procedures and weather criteria prescribed by the AAMA who is responsible for the airspace in which flight is being conducted.

b. All air traffic operating under IFR will be provided air traffic control service and, to the maximum extent feasible, positive radar control. Positive separation of traffic is dependent on knowledge in the airspace management center, located in the CRC, of all aircraft movements operating under like conditions; therefore, clearance for all instrument flights will be issued by the airspace management center. Coordinated tactical clearance procedures will normally be used and separation of aircraft will be effected through air traffic control facilities designated by the airspace management center.

c. When IMC prevail and tactical operations of an emergency nature must be conducted on an immediate basis, the traffic control capabilities of terminal radar facilities may be used, when available, to provide traffic separation until such time as control may be coordinated with and assumed by an airspace control facility. The airspace management center will be notified of such operations by the most expeditious means

available.

d. Flight plans will be filed for all flights requiring clearance into instrument flight conditions and all flights penetrating an airspace control line or the air traffic control line. Clearances for such flights will be issued by the tactical air control center through the appropriate Army air traffic control facility. Tactical aircraft flying an immediate close air support mission, or on an emergency support mission, are exempt from filing flight plans. In these cases, the following procedures apply:

(1) The authority ordering the mission will notify the appropriate air traffic control element.

(2) If a mission is ordered from a location where an airspace control element is not available, the pilot will contact an appropriate air traffic control element as soon as practicable after becoming airborne.

e. Division assigned/attached aircraft operating under VFR within the division area, will normally not be required to file flight plans. When air operations are conducted in VMC, responsibility for air traffic separation is vested in the aircrews. Monitoring service and/or navigational assistance should be obtained from an appropriate air traffic control/airspace management facility, when available.

f. Normal peacetime traffic separation criteria and procedures should be applied; however, if such criteria are not sufficiently responsive to mission requirements, airspace management facilities may employ reduced criteria. In consonance with the degree of risk deemed acceptable by higher authority, this reduced criteria may mean that—

(1) Even though the system may be saturated with numerous aircraft of different types performing varied missions, acceptance of tactical offensive and defensive traffic will not be reduced or denied, as is standard in normal air traffic control procedures.

(2) Air traffic control delays to priority traffic because of lack of standard separation will not be tolerated; rather, the tactical mission will continue without delay with the risk of reduced separation accepted as necessary.

(3) Low-priority traffic may be denied access, diverted, or delayed when airspace saturation is imminent.

(4) In an effort to provide the maximum safety practical to a mission through correlation of known air traffic, acceptance of a lesser degree of control than is normal during peacetime may be necessary.

4-16. Rear Operations Area Procedures

a. The Army air traffic control unit provides continuous (day and night) air traffic regulation in the rear operations area for aircraft operating in the Army Air Traffic Regulation and Identification System. The Army air traffic control unit also provides emergency and routine weather and air-warning information to aircraft in flight. The AMLS arranges for the integration of Army air traffic control unit facilities with other service component control facilities. Coordination of Army air traffic with other service component air traffic and integration of Army air traffic into and out of the division areas are accomplished by the Army air traffic control unit. Thus, this unit provides the interface for integrating and controlling Army air traffic in the rear operations area.

b. The Army air traffic control unit will establish an FOC in the rear operations area for the control of Army aircraft. FCC organic to the Army air traffic control unit are established to extend the communication capabilities of the FOC. They normally serve as communication links between the FOC and the terminal facilities of Army instrumented airfields. The FOC and FCC are located as necessary to provide coverage to aircraft operating in the rear operations area. Aircraft moving between the rear operations area and the tactical operations area will be handed over or received from FCC operated by organic division elements. The FOC is collocated with, or electronically connected to, the CRC. An FCC may assume the role of the FOC if the FOC is rendered inoperative or is displacing.

4-17. Tactical Operations Area Procedures

a. The division organic FCC serves as the primary airspace management facility for Army air traffic in the tactical operations area. This FCC is usually located to permit optimum air-ground communications and provides a communication link between the terminal facilities of the division airfields, other airfields located nearby, the division tactical operations center, and the FOC. The FCC will establish liaison with the direct support Hawk AADCP. The Hawk battalion radar, with real-time input from the associated fire units, can provide

increased low altitude radar coverage over the division and forward of the forward edge of the battle area through voice and data links to the battalion AADCP. Details for AADCP/FCC integration are described in appendix B, example B-1 (Annex B to 52d Mech Div SOP 1). This integration plan maximizes this low altitude radar coverage capability by providing a link between Army air defense, Army aviation, and Air Force systems through the Hawk battalion AADCP. However, the air defense mission will remain the first priority for the Hawk battalion should a conflict occur. The AADCP/FCC will provide certain airspace management service to aircraft operating in and forward of the division area on an as-required or emergency basis. The following are two examples of options that may be selected in siting the division FCC in relation to the supporting Hawk AADCP in order to maximize service to aircraft:

(1) Collocate an element of the FCC with the Hawk AADCP.

(2) Collocate the FCC with the Hawk AADCP.

b. The division FCC is responsible for providing en route flight following service for Army aircraft within the division and serves as a point of access into the Army air traffic control system. As a minimum, flight following services will be provided for aircraft crossing the airspace control line or air traffic control line.

c. Employment of Army aviation in the brigade area may require terrain flying techniques under control of the brigade. Aviation unit operations will provide advance entry information briefings, to include the supported unit's tactical situation, to aircrews entering the brigade area. The supported unit (brigade/battalion) must be provided advance information on arrival time and place of entry of Army and other service supporting aircraft entering the respective area to provide support. Army aircraft operating in the brigade and battalion areas are routinely controlled through the chain of command. The degree of control necessary to prevent interference will depend in large measure on the intensity of combat activity. Commanders communicate directly with Army aviators to accomplish tasking and to coordinate tactics and techniques.

Section V. SPECIAL JOINT OPERATIONS

4-18. General

Most procedures in this manual apply during joint operations; however, some major changes in

overall organization and control concepts will impact on the airspace management arrangements for communications. In addition,

certain potential problem areas should be emphasized.

4-19. Joint Airborne Operations

a. Phases. The phases of a joint airborne operation are: mounting, air movement, assault, and subsequent operations.

(1) The mounting and subsequent operation phases employ airspace coordination procedures essentially as outlined in this manual, except that airlift required to bring the airborne forces to the objective area is requested and arranged at the higher echelons.

(2) The air movement phase is the responsibility of the Air Force commander and involves no special airspace management or coordination organization. This phase requires special attention to the need for flight routes to exploit friendly air defense and to avoid enemy air defense. Special reserved corridors may be required to simplify air defense identification and to prevent interference by other friendly forces.

(3) The assault phase often involves a mix of parachute and air-landed operations. The nature of future conflict indicates a likelihood of brigade- and battalion-sized operations, although the division assault should not be ruled out. The assault phase is of special interest because there are certain unique organizational problems that demand special airspace coordination procedures on the part of the senior airspace coordination element in the objective area. The remainder of this paragraph pertains to the assault phase of a brigade-sized operation, conducted as a joint Army-Air Force effort under the control of a joint airborne task force commander.

b. Organization.

(1) The joint task force commander will control all joint task force forces and predefined airspace in the objective area. The joint task force may provide all of its own air defense, but it is more likely that it will operate in an area covered by an area air defense system. Army aviation may or may not be included in the assault phase. In any case, the joint task force commander should appoint a joint task force area air defense commander/area airspace management authority and direct that all air defense/airspace management systems in the objective area be integrated under the area air defense commander's/area airspace management authority's broad direction.

(2) Air Force combat control teams (para 2-8i) will initially control aircraft traffic in the objective area, as directed, until an air traffic regulation system can be established within the airhead. Control will be exercised by the normal

Air Force and Army air traffic regulation systems when these are landed and put into operation. However, the combat control teams will normally retain control of selected traffic in designated drop, landing, and extraction zones. The Army FCC may be airlanded for eventual control of Army air traffic; however, Army representatives at Air Force facilities would probably suffice in the airhead type of operation.

(3) Air Force TACS elements may initially be in an airborne configuration, with ground-to-air communications provided by the Air Force.

(4) Initially, the brigade performs both brigade and division airspace management functions and, therefore, should be augmented. The brigade requires communications with the Air Force facility in the airhead and, if the airhead is within an area air defense/airspace management system, back to the nearest external AME.

(5) The small size of the airhead area indicates that control elements involved in airspace coordination should be consolidated to improve inter- and intra-service coordination. Geographic span of control problems are minor and do not warrant a highly dispersed control element deployment.

c. Priorities.

(1) Airspace management rules will acknowledge that the priority during the assault is initially to the Air Force aircraft that bring in the troops and equipment to build up a viable airhead. In latter stages of the assault, priorities will shift as in any other operation. However, it can be expected that Air Force traffic will continue to have high priority because it is the resupply lifeline of the airhead and provides much of the fire support.

(2) The operation must enjoy friendly air superiority, at least during the air movement and initial assault. This consideration relieves some of the stress on air defense artillery and, combined with the fact that the initially deployed air defense artillery will be operating almost totally by SOP (they may not be on the "assault net"), makes it probable that initial air defense artillery fires will be highly restricted. However, the air defense artillery control system must be established as soon as possible to permit effective response to enemy air reacting to the presence of the airhead—overall friendly air superiority notwithstanding.

(3) Surface-to-surface fire support weapons may initially be firing in all quadrants, making it especially important for early establishment of an element at the brigade to coordinate at the fire

support coordination center/aviation interface. This interface may be the primary airspace coordination problem during the early assault stages.

(4) Patients are normally evacuated on Air Force resupply aircraft that are reconfigured for patient evacuation at the airhead. Aeromedical evacuation requirements beyond the capability of normal backhaul of resupply missions would be relayed either through the administrative/logistics net or medical channels to the point at which the requests would interface with the Air Force capability to support them. At this point, additional priority airspace traffic may be generated.

4-20. Joint Amphibious Operations

a. General. This paragraph considers an Army division with a Hawk battalion, designated in direct support, operating as part of an Army-Marine amphibious landing force, with air support provided by Navy and Marine aviation. For discussion purposes, it is assumed that the Army units must operate within naval airspace management procedures and organization for amphibious operations.

b. Airspace Management Responsibilities. The amphibious task force commander will manage airspace of defined dimensions encompassing the amphibious objective area. He will establish a single system for airspace management within the amphibious objective area and for coordination within exterior (if any) management agencies. Airspace management as exercised by the naval system denotes a service provided to permit flexibility of actions. This management system is described in FM 31-11.

c. Airspace Management System Phasing. The airspace management system is initially afloat. As the beachhead builds up, the airspace management system ashore is built up incrementally under the control of the system afloat. Control passes to the landing force as it is able to assume airspace management functions. Army operational involvement begins with the ship-to-shore movement. Prior to that time, Army representation should be stationed in the supporting arms coordination center in the task force commander's flagship to insure an orderly transfer of Army control functions ashore. The Army division representation in the supporting arms coordination center forms a division tactical operations center (afloat) alongside any Marine division fire support coordination centers (afloat). The division tactical operations center/fire support coordination center operates closely with

the air support and anti-air-warfare sections of the tactical air control center (afloat), which is also located within or near the supporting arms coordination center. The tactical air control center coordinates planning and execution of all operations in the objective area airspace to include attack, transport, and fighter aircraft; helicopters (by means of a helicopter direction center or helicopter coordination center aboard another ship); air defense artillery; afloat/ashore surface-to-air missiles; air warning, and electronic warfare. Intermediate control elements (afloat) are used as required. The remainder of this discussion considers operations ashore with the understanding that control is actually passed ashore incrementally.

d. Navy/Marine Procedures and Organization (Ashore).

(1) Figure 4-1 depicts the airspace management organization ashore, emphasizing integration of Army facilities into the system.

(2) The Marine tactical air command center (ashore) coordinates all operations in the landing force objective area airspace. Control authority is delegated as deemed necessary.

(a) The Marine tactical air command center, during operations ashore, becomes the single "Airspace Management Authority" within the landing force operations area. If more than one tactical air command center-type element is required ashore due to the scope of operations, all but one are redesignated as tactical air direction centers and are assigned specific area responsibilities under the tactical air command center.

(b) The Marine tactical air command center (ashore) is equipped to discharge all the functions of the tactical air control center (afloat); however, the Marine tactical air command center (ashore) normally will be assigned as its initial responsibility only those tasks that relate to the control of aircraft engaged in support of the landing force, such as close air support, helicopter operations, and forward reconnaissance. As the situation ashore progresses and the landing force tactical air control capability increases, responsibility for control of anti-air warfare and air warning generally will be passed ashore. Until full control is assumed ashore, the Marine tactical air command center (ashore) acts as a tactical air direction center under the tactical air control center (afloat).

(c) The landing force tactical air command center is equipped and operated by personnel from the air component (Marine air wing, in this discussion) of the landing force. The

senior Army elements should provide liaison to the tactical air direction centers and/or tactical air control centers, as appropriate.

(3) The direct air support center is the principal air control agency subordinate to the Marine tactical air command center for the control of direct air support and assault support aircraft, both fixed wing and helicopter. The direct air support center coordinates direct air support missions controlled by on-the-scene air controllers and air support radar teams. Marine Redeye personnel at the direct air support center disseminate warning and control information to the Marine Redeye units. The direct air support center is normally the first major air control support facility established ashore during an amphibious operation. The direct air support center is always located near the Marine division fire support coordination center or the Army division equivalent—the fire support element. The Marine direct air support center differs from

the corps-level Air Force direct air support center discussed in chapter 2 in that it is usually at division level, controls and coordinates *all* direct air support, and exercises a degree of Redeye control. Thus, it operates not only as a counterpart to the Air Force direct air support center, but also performs some AME-type functions (coordinates between fixed-wing aircraft and helicopters and disseminates air defense artillery information) and an FOC/FCC-type function (control of assault and support helicopters).

(4) The tactical air control parties subordinate to the direct air support center are much like the Air Force tactical air control parties discussed in chapter 2. Tactical air control parties establish liaison and communications between supported units and air control agencies, inform and advise the ground unit commander on the employment of supporting aircraft (fixed wing and helicopter), and request and control air

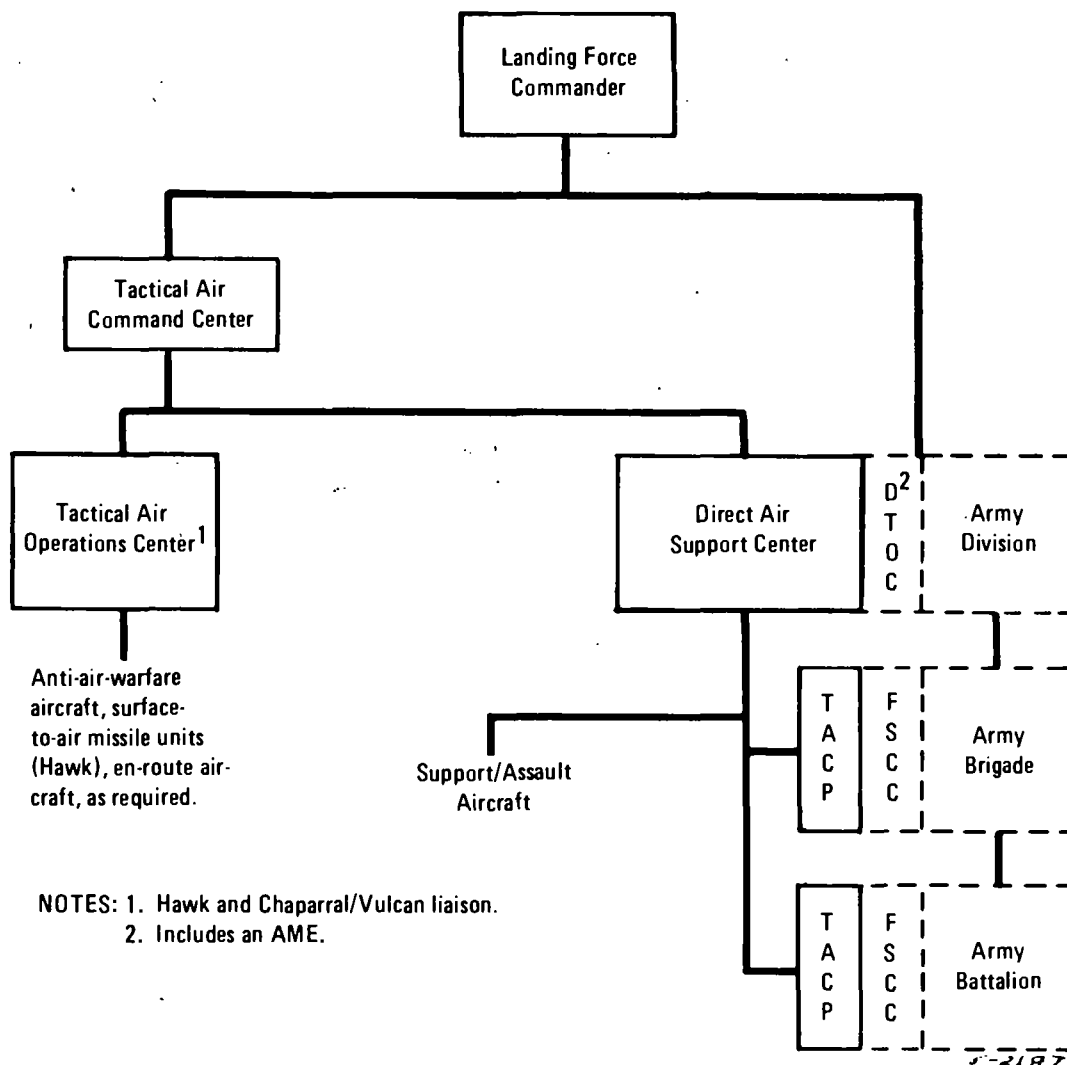


Figure 4-1. Airspace management organization (ashore).

support missions. The battalion tactical air control parties have two forward air controller parties, while the tactical air control parties at regiment and division have none.

(5) The tactical air operations center is a subordinate operational component of the Marine air command and control system designed for control and direction of anti-air-warfare operations in assigned air sectors. Functions are similar to those that would be performed by combining the CRC and the AADCP discussed in previous chapters. The control personnel of the Hawk battalion and Chaparral/Vulcan liaison personnel are integrated with the personnel from the air component element of the landing force to assist in the operation of the tactical air operations center. The tactical air operations

center serves as the operational command post for the sector anti-air-warfare coordinator. The mission of the tactical air operations center is to detect, identify, and control intercept of hostile aircraft and missiles and to provide en route navigational assistance to all friendly aircraft as necessary to the accomplishment of support missions.

(6) The Army division's organic Chaparral/Vulcan battalion provides liaison to the tactical air operations center. The liaison element and the AME must both have communications that will permit entry into a division broadcast net. This will allow dissemination of critical information to Chaparral/Vulcan fire units and Redeye sections.



CHAPTER 5

COMMUNICATIONS-ELECTRONICS

5-1. General

Complete, reliable, and compatible communication networks with sufficient priority to insure uninterrupted information flow are indispensable to the successful functioning of the airspace management system. Maximum use should be made of radar or other electronic means for identification and air traffic control services. When radar control is not possible or practicable, identification and control will be accomplished by procedural methods. Standing operating procedures and operation plans/orders prescribe normal communications-electronics support for airspace management. Communications are integrated into a wide network to provide airspace management for Army and Air Force aircraft, air defense, and indirect fire means. Electronic assets organic to air defense elements may be used to support the airspace management system provided the capability to perform the primary purpose of these systems is not degraded.

5-2. Requirements

a. Aircraft. Aircraft are managed through Army and Air Force facilities. These facilities are collocated or interconnected by multi-channel radio and cable providing telephone and teletype services and by single-channel radios operating in the HF, UHF, and VHF wave bands. At the maneuver echelons of command (principally brigade and battalion), tactical FM radio is the primary means of communication, while sole-user multichannel systems are used at higher levels.

b. Army Air Defense and Field Artillery Fires. Dedicated communication networks are employed to centrally controlled Hawk and Nike-Hercules fire units located in the combat zone. Chaparral/Vulcan and Redeye air defense and field artillery fires are controlled through successive levels in the command and fire-direction channels.

c. Division and Corps Communication Systems. Paragraph 4 in appendix B, example B-1 (Annex C to 52d Mech Div SOP 1), describes the Army air traffic control, aviation, and air defense radio nets used in the management of airspace at the division level. Paragraphs 4 and 5 in appendix C, example C-1 (Annex B to I Corps SOP 1), detail the corps airspace management

radio net structure and the corps multichannel communication system.

5-3. Communications Support

Basic communications-electronics doctrine is contained in FM 11-50, FM 11-92, and FM 24-1. Airspace management communication requirements are met by use of the communication means available and by habitual collocation of airspace management elements as described in preceding chapters. Figures 5-1 and 5-2 depict the airspace management communications user need lines typically required within the combat zone. Army and Air Force field manuals pertaining to operation of each installation or unit indicated prescribe the specific communication services established.

5-4. Electronic Support

Primary electronic support for airspace management is provided by Army and Air Force air traffic control elements, who install and operate navigational aids, and by air defense elements, who install and operate air defense radar systems. These electronic systems are designed to support air traffic control and air defense functions respectively and may, through coordination, be made available to provide additional airspace service for the division/corps. However, air defense electronic assets are employed in only those cases where the equipment is not engaged in its primary air defense mission, as determined by the responsible air defense commander. Appendix B, example B-1 (Annex B to 52d Mech Div SOP 1) provides the procedures that may be used to integrate Hawk battalion radar into the airspace management system.

5-5. Considerations

In developing SOP and operation plans and orders, commanders at all echelons must be sensitive to the time delay inherent in the use of the command communication structure when disseminating instructions for use of airspace over the combat zone. To the extent practicable, broadcast communication networks should be established from the airspace management element directly to the lowest organizational level having positive operational control over aircraft

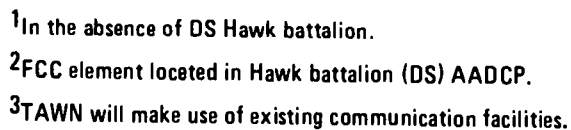
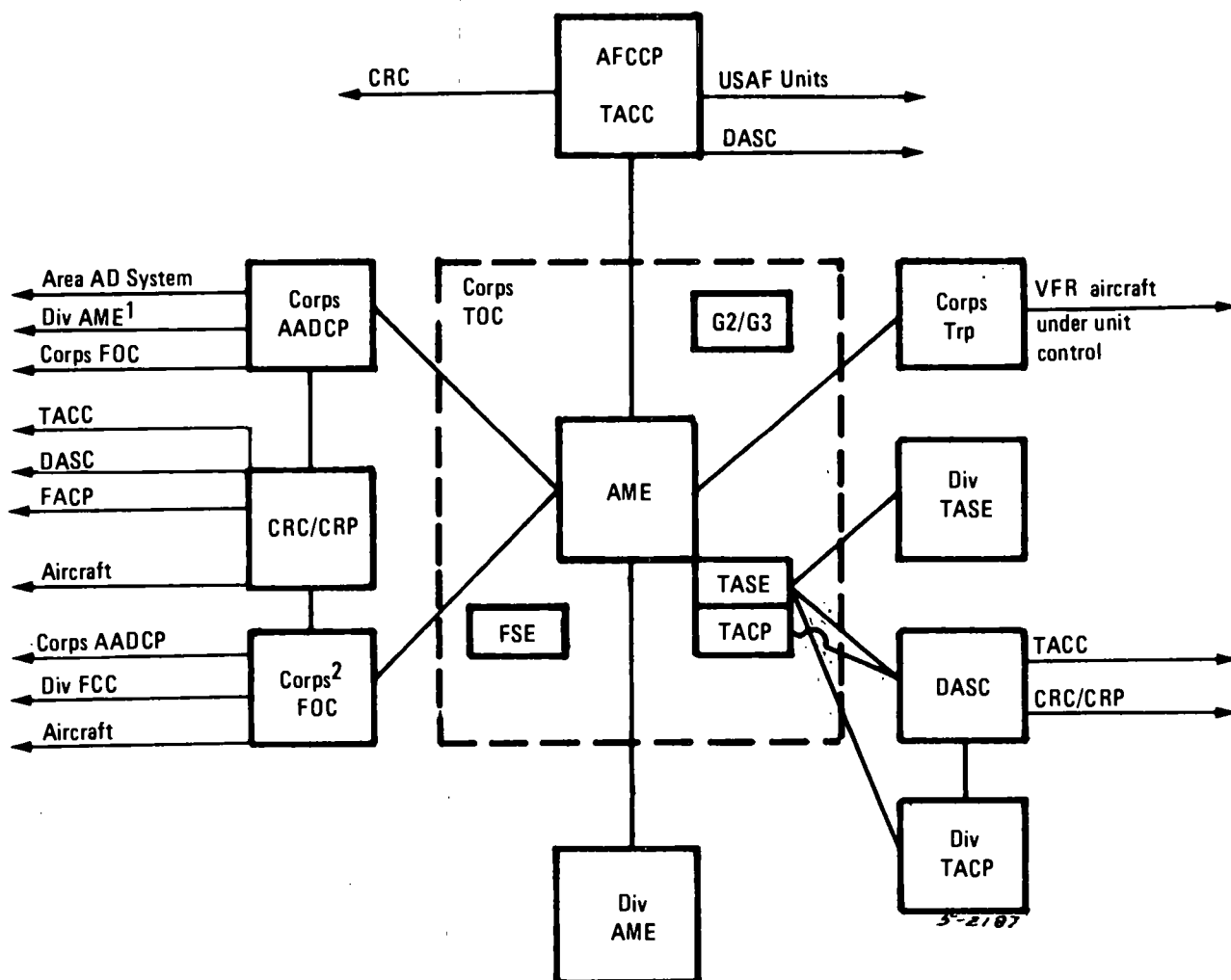


Figure 5-1. Division airspace management system communications user need lines.

and air defense fire units. This procedure will insure timely dissemination of change data to airspace users; for example, announcement or redesignation of minimum risk routes or changes in weapon control status. In that control and

direction of forces is a command responsibility, acknowledgement of receipt for and compliance with changes in airspace use must be monitored by or passed through command communication channels.



¹In the absence of DS Hawk battalion.

²Collocated with or electronically connected to CRC.

Figure 5-2. Corps airspace management system communications user need lines.

APPENDIX A

REFERENCES

A-1. Army Regulations (AR)

310-25 Dictionary of United States Army Terms.
310-50 Authorized Abbreviations and Brevity Codes.

A-2. Department of the Army Pamphlets (DA Pam)

310-series Military Publication Indexes.
310-35 Index of International Standardization Agreements.

A-3. Joint Chiefs of Staff Publications (JCS Pub)

.1 Dictionary of United States Military Terms for Joint Usage.
(FOUO)2 Unified Action Armed Forces.
(FOUO)8 Doctrine for Air Defense from Oversea Land Areas.
(FOUO)12 Tactical Command and Control Procedures for Joint Operations.

A-4. Field Manuals (FM)

1-60 Army Air Traffic Operations.
1-100 Army Aviation Utilization.
6-20 Field Artillery Tactics and Operations.
11-50 Communications in Armored, Infantry, and Infantry (Mechanized) Divisions.
11-92 Corps Signal Communications.
24-1 Tactical Communications Doctrine.
31-11 Doctrine for Amphibious Operations (NWP 22(B)/AFM 2-53/LFM 01).
31-12 Army Forces in Amphibious Operations (The Army Landing Force).
(C)32-20 Electronic Warfare (U).
44-1 US Army Air Defense Artillery Employment.
44-3 Air Defense Artillery Employment—Chaparral/Vulcan.
61-24 Division Communications.
61-100 The Division.
100-5 Operations of Army Forces in the Field.
100-15 (Test) Larger Unit Operations.
100-26 The Air-Ground Operations System.
100-32 (Test) Tactical Electronic Warfare.
101-5 Staff Officers' Field Manual: Staff Organization and Procedure.



APPENDIX B**EXAMPLE OF DIVISION STANDING OPERATING PROCEDURES
FOR AIRSPACE MANAGEMENT****Example B-1. Division Airspace Management****Standing Operating Procedures**

(Classification)

52d Mech Div
FORT LEAVENWORTH, KANSAS
1 October 197__

**STANDING OPERATING PROCEDURES
NO 1****AIRSPACE MANAGEMENT****Section I. GENERAL**

1. *References:* Annex A (References).
2. *Purpose:* To establish procedures for the coordination, integration, and regulation of airspace in the division area of operations (AO).
3. *Concept:*
 - a. The Commander, 29th Tactical Air Force (TAF), is designated the area airspace management authority (AAMA) and the area air defense commander. The provisions incorporated in these standing operating procedures (SOP) are in accordance with the airspace management procedures established in the 29th TAF tactical standing operating procedures (TSOP) and the I Corps TSOP. The division airspace management element (DAME) will continually coordinate with the corps airspace management element (CAME) to insure an unimpeded flow of essential information concerning the use of airspace in the division AO. The authority of the division over each airspace user will vary with the situation.
 - b. These SOP are designed to identify functional responsibilities in a system based on the principle of management by exception. To accomplish this end, organizations assigned, attached, or under the operational control of this division, will insure that their procedures are such that any necessarily routine coordination is minimal. In addition, contingent procedures will be established to insure continuity of operation in a degraded airspace management system.
 - c. The DAME develops and coordinates procedures for the use of airspace directly under the control of division. Airspace management priorities and execution details will be identified in the airspace utilization annex to the division plans/orders (example B-2).
 - d. The DAME is a manual planning and management facility with limited information-handling capabilities; therefore, the principle of resolving potential user conflicts by plans and SOP is emphasized. Plans and SOP will delegate the necessary authority to the lowest possible level of command for taking action to resolve an observed conflict. The provisions of these SOP will be followed during all CPX/FTX to promote familiarity with procedures.

Section II. COMMAND AND STAFF RELATIONSHIPS/RESPONSIBILITIES

1. *Command:*
 - a. I Corps. The Commander, I Corps, is responsible for coordinating and establishing an integrated joint airspace management system with the AAMA. The CAME serves as the focal point at corps for the coordination of airspace management.
 - b. 52d Mech Div. The Commander, 52d Mech Div, is responsible for conducting airspace management for the division.

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c. Brigade/Battalion. Normally there is no requirement for a special staff element at maneuver brigade or battalion dedicated to airspace management. The maneuver commander is responsible for coordinating his airspace activities when those activities may impact on other airspace users.

d. 1st Bn (Hawk, SP), 458th ADA. The Hawk battalion is designated in direct support of the division. The commander will locate Hawk fire units to facilitate the accomplishment of division priorities and to accommodate airspace management functions as cited in Annex B (Integration Plan—AADCP with an FCC element). The following are special requirements for the airspace management function:

(SOP 1-52d Mech Div)

(1) Insure that the division air defense officer and DAME are provided low altitude radar coverage diagrams as soon as possible to facilitate air defense coverage and airspace management integration.

(2) Establish and maintain manual plotting and voice communication facilities to back up the digital data links.

(3) Coordinate all area air defense matters with the Chaparral/Vulcan liaison officer to include air defense warnings, weapon control status and rules of engagement changes, and hostile and friendly aircraft data.

(4) Provide a liaison team to operate in the division tactical operations center.

2. Staff: Staff responsibilities and command relationships are as specified in FM 101-5, unless otherwise indicated in these SOP.

a. ACofS, G3, Operations. The ACofS, G3, will insure that these SOP are kept current and that they are followed during training exercises at all levels. He exercises staff supervision over airspace management and the DAME and insures that appropriate instructions pertaining to airspace management are published in the airspace utilization annex. He will insure that all necessary personnel required to staff the DAME are represented in the division tactical operations center and that necessary communications are available for mission accomplishment. In coordination with the ACofS, G2, he recommends to the commander the minimum number of aircraft that should constitute a multiple flight and provides for the planning to positively control and coordinate such flights with the air defense forces.

b. ACofS, G4, Movements. The ACofS, G4, will provide the DAME with supporting airlift information pertaining to airspace management to include—

(1) Preplanned and immediate airlift support requests and the priorities of approved requests.

(2) Location of logistic installations.

(3) Other combat service support information, as required, relating to air movements.

c. ACofS, G2, Intelligence. The ACofS, G2, will provide the DAME with intelligence information pertaining to airspace management to include—

(1) Enemy air defense capabilities and threat to include radar range/altitude coverages and missile/gun capabilities.

(2) Enemy air threat (number, type, tactics, and capabilities of aircraft).

(3) Location of enemy nuclear, biological, or chemical attacks.

(4) Possible enemy capabilities to counter airspace management aids, such as communications, radars, and beacons.

(5) Possible enemy tactics for employing aircraft in the division AO.

(6) Likely enemy aircraft avenues of approach.

d. Air Defense Officer. The division air defense officer is the Commander, 1st Bn (C/V, SP), 441st ADA. To assist in the division airspace management effort he will—

(1) Provide ADA personnel and necessary equipment to staff the air defense element of the DAME.

(2) Provide liaison personnel to the 1st Bn (Hawk, SP), 458th ADA, Army air defense command post (AADCP).

(3) Inform the DAME of AADCP and fire unit locations.

(4) Provide the DAME and the Hawk battalion AADCP with alert information derived from the forward area alerting radar (FAAR) and/or the forward area Chaparral/Vulcan crews.

(5) Advise the commander on all matters pertaining to division air defense, to include recommending air defense priorities.

(6) Coordinate with the Hawk battalion to insure integration of the Hawk and short-range air

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defense (SHORAD) weapons.

e. Aviation Officer. The division aviation officer serves as the principal aviation advisor to the division. To assist the DAME he will—

(1) Arrange for aviation personnel and necessary equipment to staff the aviation element of the DAME.

(2) Arrange for a flight coordination center (FCC) element to integrate with the 1st Bn (Hawk, SP), 458th ADA, AADCP.

(3) Determine flight plan requirements for division aircraft operating under instrument meteorological conditions (IMC) and visual meteorological conditions (VMC).

(4) Establish procedures for integrating aircraft entering or leaving division AO.

(5) Recommend positioning of navigational aids and procurement of additional aids as required.

(6) Coordinate with the CAME for integrating the division FCC with flight operations center (FOC)/control and reporting center (CRC)/control and reporting post (CRP) facilities.

(7) Recommend IMC or VMC minimums under which division aircraft should operate.

(8) Recommend the site of the division main airfield and the requirement for a terminal control zone and positioning of the FCC (-).

(9) Establish the air traffic regulation system for the division and disseminate this information to all aviation elements operating within the division AO.

f. Fire Support Coordinator. The fire support coordinator for the division is the Commander, 52d Mech Div Arty. He provides the following airspace management information to the DAME through the fire support element.

(1) Location of nuclear fires and significant preplanned indirect fires.

(2) Field artillery battery locations.

g. Electronic Warfare Officer (Assistant G3, Operations/G2, Intelligence). The electronic warfare officer will—

(1) Provide the DAME with estimates on enemy jamming capabilities and location of emitters when known.

(2) Provide the DAME with time and location of jamming operations by division elements or by higher headquarters that may affect division airspace management facilities or aids.

(3) Inform the DAME of other electronic warfare activities that might impact on airspace management.

(4) Be prepared to react to hostile or friendly electronic warfare activities that degrade the airspace management system.

h. Chemical Officer. The chemical officer will provide the DAME with information concerning—

(1) Friendly and enemy nuclear strikes with effective wind messages.

(2) Radiation fallout plots.

(3) Enemy employment of nuclear, biological, and chemical weapons.

Section III. FUNCTIONS

1. *Division Tactical Operations Center*: The division tactical operations is the command installation in which necessary personnel and communication facilities are centralized to plan, control, and coordinate tactical operations. Within the division tactical operations center are located the elements necessary to coordinate airspace management functions. The chief of staff will insure that sufficient space is provided in the division tactical operations center for collocation of the DAME, fire support element, and tactical air support element. The DAME serves as the focal point for coordinating airspace management activities at the division and with adjacent and higher headquarters. The officer-in-charge, division tactical operations center, has the authority to resolve conflicts.

a. *Division Airspace Management Element*. The DAME receives information and requirements necessary for the management of airspace in the division AO through coordination with the CAME, fire support element, tactical air support element, aviation officer, air defense officer, G2/G3 elements, and liaison personnel. This list of personnel and elements should not be construed as limiting the DAME sources of information. Staffing of the DAME will be that recommended for the airspace control element

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in FM 101-5. The DAME will—

(1) Through the correlation of airspace management information and data received, identify and resolve potential conflicts concerning the use of airspace within the division AO.

(2) Develop and maintain the airspace utilization map.

(3) Develop and maintain recommended minimum risk routes (MRR) through the division AO and provide to the CAME on request.

(4) Maintain current information on all restricted areas, standard use Army air routes, flight corridors, air defense weapons-free zones, significant preplanned field artillery fires and nuclear strikes, airmobile operations, other major aviation operations, and preplanned close air support strikes and reconnaissance missions.

(5) Relay information concerning air defense warnings, weapon control statuses, rules of engagement, and identification criteria pertaining to air defense and Army aviation activities within the division AO.

(6) Maintain a current picture of the air defense and aviation posture within the division AO and advise the commander and staff on such matters.

(7) Maintain the status of required airspace management aids and disseminate information concerning their location/use as required.

(8) Coordinate with the CAME concerning establishment of and changes to coordinating altitudes.

(9) Inform division units of the number of aircraft designated as constituting a multiple flight and relay changes as they are received from the ACofS, G3.

(10) Disseminate information as obtained concerning enemy air and air defense activity.

(11) Coordinate all requirements for flight plans, restricted areas, air defense artillery weapons-free zones, and flight rules and procedures.

(12) Coordinate division requirements for airfield and terminal control zones with the CAME.

(13) Provide airspace management information relevant to development of air movement plans and insure that airlift requirements for use of airspace are included in airspace utilization annexes to operation plans and orders.

b. Fire Support Element. The fire support element will provide to the DAME—

(1) Location of the fire support coordination line.

(2) Information concerning location of significant preplanned indirect fires (major preparation and final defensive fires) and nuclear strikes.

(3) Location of significant immediate fires.

(4) Location of major fire units (battery and higher) as soon as they are known.

c. Tactical Air Support Element. The tactical air support element, in cooperation with the tactical air control party, will inform the DAME of Air Force activity within the division AO and of any Air Force aircraft passing through the division AO.

(1) G2 air informs the DAME of all preplanned reconnaissance flights that will penetrate the airspace over the division AO. Information must include time, route of flight, altitude, number of aircraft involved, and electronic countermeasures to be employed.

(2) G3 air informs the DAME of all preplanned and immediate tactical air requests in the division AO. Information must include location, time and duration of strike, number of aircraft involved, and electronic countermeasures to be employed.

2. *Division Flight Coordination Center:* The division FCC is responsible for providing en route, flight following service for Army aircraft within the division AO and serves as a point of access into the Army Air Traffic Regulation and Identification System. As a minimum, flight following services will be provided for aircraft crossing airspace control lines or the air traffic control line. The FCC will be positioned to provide maximum coverage to aircraft operating in the division AO. The FCC will—

a. Take necessary action to resolve observed conflicts concerning the use of airspace.

b. Integrate aircraft entering the division AO.

c. Receive en route air traffic from and handover traffic to adjacent air traffic control facilities.

d. Provide the Hawk AADCP with an FCC element. Annex B (Integration Plan—AADCP with an FCC element).

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- e. Relay information concerning airspace management as required by the DAME.
- f. Maintain current status of terminal facilities, navigation aids, restricted areas, coordinating altitudes, standard use Army air routes, and other information pertinent to the air traffic operations.
- g. Notify the FOC of division aircraft proposing penetration of the coordinating altitude.

3. *Army Aircraft:*

a. Army aircraft assigned/attached to division and operating within the division AO will not be required to file flight plans with the division FCC. Employment of Army aviation in the brigade AO may require terrain flying techniques under the control of the brigade commander. Aviation unit operations will provide advance entry information to aircraft entering the brigade area. Aircraft operating within the division AO may request flight following from the FCC. Pilots will be familiar with the supported unit's tactical situation.

b. Army aircraft intent on entering or leaving the division AO will file flight plans with the FCC or the FOC as appropriate. These flight plans may be filed through unit operations or by radio with the FCC/FOC.

c. Army aircraft operating under VMC within the division AO do not require air traffic control en route clearances.

d. Army aircraft operating under IMC will receive clearances from the appropriate air traffic control facility (FCC in the division AO, FOC/CRC/CRP in the corps rear operations area).

e. Army aircraft operating in the division AO must comply with published identification, friend or foe (IFF) mode/code settings. An IFF transponder checkout can be obtained from the AADCP/FCC element.

f. Army aircraft penetrating above the coordinating altitude will notify the FCC either by direct communication or through unit operations. Notification will be made as far in advance as possible.

g. On request, Army aircraft may obtain radar-supported emergency en route advisory services from the AADCP/FCC element.

4. *Communications:* Annex C (Communications).SMITH
MG

OFFICIAL:

/s/Doe
DOE
G3

Annexes: A—References

B—Integration Plan—AADCP with an FCC Element

C—Communications

Distribution: A

(Classification)

Note. Example B-2 has been added at the rear of this SOP as an illustration of an airspace utilization annex.

(Classification)

ANNEX A (REFERENCES) to SOP NO 1--52d Mech Div

References:

1. 29th TAF TSOP.
2. I Corps TSOP.
3. AR 310-25.
4. AR 310-50.
5. FM 1-60.
6. FM 1-100.
7. FM 6-20.
8. FM 11-50.
9. FM 11-92.
10. FM 24-1.
11. FM (C)32-20.
12. FM 44-1.
13. FM 44-3.
14. FM 44-6.
15. FM 61-24.
16. FM 61-100.
17. FM 100-26.
18. FM 100-32 (Test).
19. FM 100-42/TACM 2-1 (Test) (when published).
20. FM 100-44 (Test).
21. FM 101-5.
22. JCS Pub 1.
23. JCS Pub 2.
24. JCS Pub 8.
25. TOE 37H.

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ANNEX B (INTEGRATION PLAN—AADCP WITH AN FCC ELEMENT) to SOP NO 1—52d Mech Div

1. *Purpose:* This annex provides the procedures for integrating the 1st Bn, 458th ADA, AADCP into the airspace management system of the division. It also includes responsibilities, equipment, and personnel requirements.

2. *Concept:* The division FCC is essentially a manual facility for flight following. Although the AN/TSQ-71 is located at the division airfield, it has a primary function of ground controlled approaches for IMC. It has a limited radar surveillance coverage of the division. The Hawk battalion radar with digital data link, real-time input from Air Force and/or associated fire units can provide increased low-altitude radar coverage for the FCC. For example, emergency navigational assistance during expected IMC or avoidance headings for unexpected conflicts, such as immediate close air support strikes or enemy air activity, could be provided. The feasibility of the concept will be dependent on the friendly/enemy air situation.

3. *Responsibilities:*

a. The Commander, I Corps, will assign tactical missions to Hawk battalions assigned to the corps when the area air defense commander has delegated corps the authority for employment of Hawk units. The 1st Bn (Hawk, SP), 458th ADA, is designated the Hawk battalion in direct support of the division.

b. The Commander, 52d Mech Div, will, in consonance with recommendations from his air defense officer, aviation officer, and Hawk battalion commander, insure that a proper site location is made available to the Hawk AADCP/FCC and provide adequate security from ground/airmobile attacks.

c. The division G3 will insure proper coordination between division tactical operations center elements and the AADCP/FCC by arranging required communication in accordance with Annex C (Communications).

d. The Commander, 1st Bn (Hawk, SP), 458th ADA, will insure that accommodations are made in the battalion AADCP for the FCC element in the manual backup facility. When possible, one of the air defense operations officers in the AADCP should be aviation qualified. In addition, he will insure that ADA personnel are properly trained to function with the FCC element and that a liaison team is provided to the division tactical operations center to facilitate planning and operations.

e. The Commander, 52d Avn Co, will provide FCC personnel to the AADCP/FCC from the division FCC.

f. The division air defense officer recommends air defense priorities to the commander and provides liaison personnel from the Chaparral/Vulcan battalion to the Hawk battalion AADCP.

4. *Operational Procedures:* Figure B-1 shows a physical arrangement of the Hawk AADCP with an FCC element integrated. Chaparral/Vulcan liaison is also shown to indicate the close coordination required with Chaparral/Vulcan units in the overall airspace management system of the division. The figure shows the primary AN/TSQ-38 fire distribution van with two radar consoles and the separate backup manual facility with the FCC element. Radio communications will be established to the division FCC on the FCC net (FM), thus facilitating communications with the FCC and Army aircraft.

a. *Personnel.* The Chaparral/Vulcan liaison officer and FCC personnel are integrated into the backup facility. Personnel from the FCC function as recorder/plotter and as flight coordinator. Data received from the Hawk fire units, CRC/CRP, and the collocated acquisition radar are displayed on two display/control consoles of the AN/TSQ-38. The operator on the left display is concerned primarily with air defense fire distribution and the operator on the right display, with surveillance. The combined mission of the two operators is to monitor/control the air battle; therefore, they will be ADA personnel. The operator on the right display, when practicable, should be an ADA aviation-qualified officer to facilitate ADA/aircraft coordination. The remaining personnel are an ADA operations officer, an ADA fire control operator, and two ADA plotters, all located in the backup AADCP.

b. *Information Flow.* The air traffic functions are performed by the FCC personnel based on data displayed on the right console. The data is converted to a grid system common to aircraft and ground operations. Based on common grid data, the FCC element takes action as required. Data from the left display console is passed to the backup AADCP where it is plotted for presentation. Based on this data, air activity reports are provided to the Chaparral/Vulcan AADCP and the DAME. The Chaparral/Vulcan liaison officer will broadcast selected hostile/friendly warnings to division air defense

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(ANX B (INTG PLAN — AADCP WITH AN FCC ELM) to SOP 1—52d Mech Div)

units and others capable of monitoring the tactical air warning net (TAWN) (when established). Priority warnings can be rebroadcast from the Chaparral/Vulcan AADCP over existing nets to fire units/squads. Additionally, weapon control statuses are passed from the area air defense commander through the CRC/CRP to the DAME and the Chaparral/Vulcan AADCP and are broadcast directly over TAWN. Change in status will be verified by authentication.

c. Priorities. In performing its functions, the AADCP/FCC will observe the following priorities:

- (1) Air defense mission.
- (2) Emergency information to pilots.
- (3) Emergency directional assistance (vectoring).
- (4) Identification and correlation.
- (5) Transponder checkout.
- (6) Routine directional assistance and flight following.

d. Equipment (Non-TOE to AADCP).

- (1) One AN/VRC-47 and one AN/VRC-24 with remotes and handsets.
- (2) One acetate covered topographical map (1:250,000) of division area with 5-kilometer grid matrix superimposed.
- (3) One manually constructed azimuth-/range-determining device (degrees and nautical miles).
- (4) Two TA-312 phones with headsets.

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(ANX B (INTG PLAN)—AADCP WITH AN FCC ELM) to SOP 1—52d Mech Div)

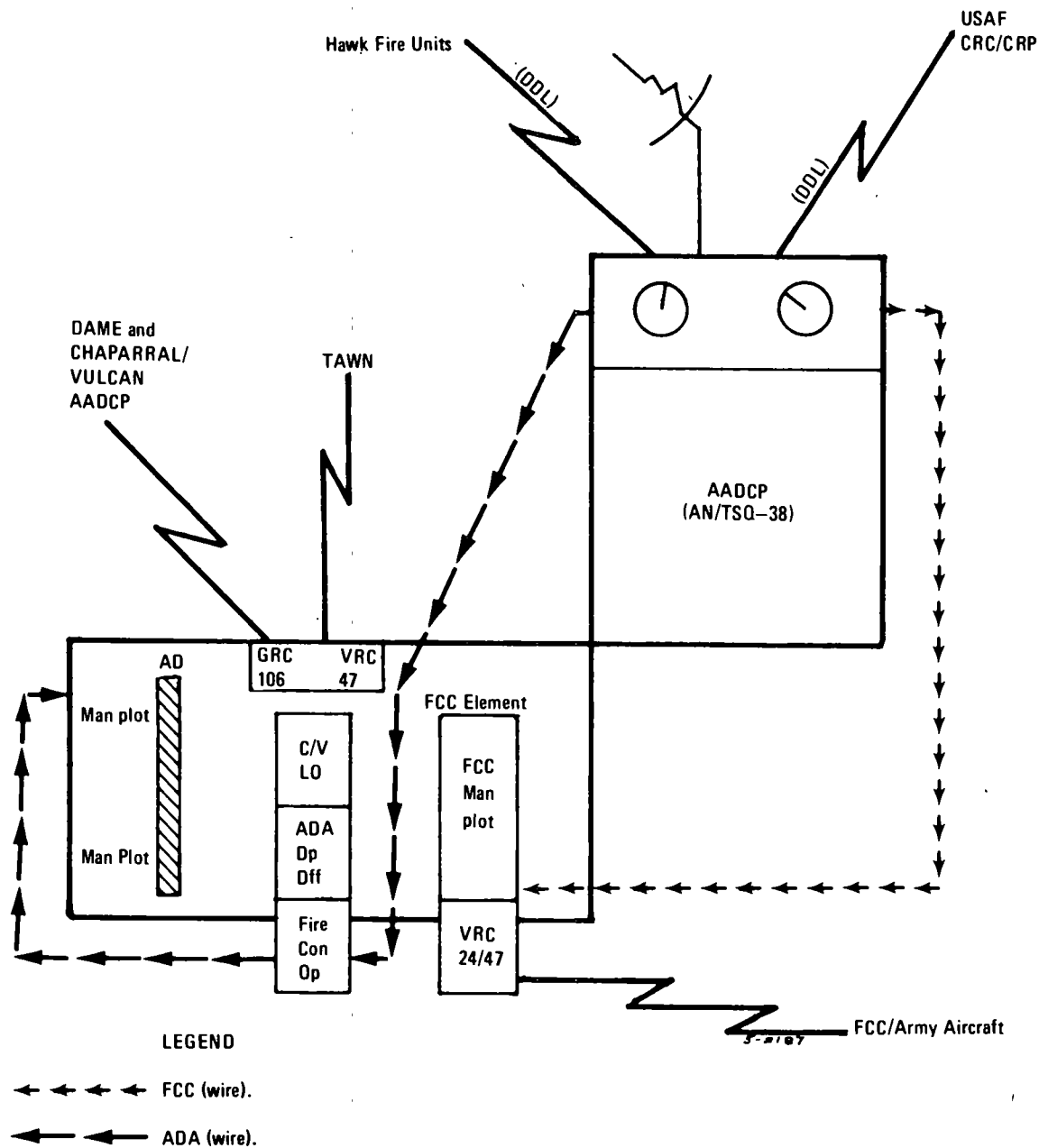
PHYSICAL ARRANGEMENT

Figure B-1. Hawk AADCP with an FCC element integrated.

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ANNEX C (COMMUNICATIONS) to SOP NO 1—52d Mech Div

1. *Purpose:* This annex identifies the normal communication networks that will support airspace management in the division AO.
2. *Applicability:* This annex applies to the units and stations (subscribers) that comprise the networks indicated. Unless otherwise indicated, the equipment required is organic to the using unit. Stations in the indicated nets that have no division airspace management function are omitted.
3. *Responsibilities:* Subordinate unit commanders will insure that the stations/subscribers required for airspace management in the division AO operate in the networks indicated.
4. *Radio Nets:*

- a. Frequency Modulated (FM); Tactical.

- (1) 52d Avn Co command net. This net is used for command and control of organic assets. Normally the division aviation officer at the DAME does not maintain a station in this net. However, when there is no other communication means available, the company may be required to provide radio-equipped liaison personnel at the DAME to insure continuous communications between the FCC (a station in the company command net) and the DAME. Appendix 1 (Division Airspace Management Radio Nets—Aviation).

- (2) 52d Mech Div air traffic control net (UHF). This net is used for actual control of Army aircraft operating within the division AO. The principal station and net control station in this net is the FCC operated by the 52d Avn Co. The FCC element at the Hawk AADCP and the 52d Avn Co airfield terminal control section are the only other ground stations normally operating in this net. Appendix 1 (Division Airspace Management Radio Nets—Aviation).

- (3) 52d Mech Div aircraft terminal control net (FM, UHF, or VHF). This radio net is used to transmit flight information regarding takeoff/landing for those aircraft using the division instrumented airfield. The airfield terminal control section is the principal ground station and net control station. Appendix 1 (Division Airspace Management Radio Nets—Aviation).

- (4) Air defense Chaparral/Vulcan battalion command net. This radio net is used for command and control of the battalion. It links the battalion commander, staff, firing batteries, radar platoon (FAAR), and the assistant air defense officer located at the DAME. When he has compatible equipment, the Chaparral/Vulcan battalion liaison officer, normally located at the Hawk AADCP, also enters this net. This net is the principal means for disseminating information regarding the control and disposition of battalion fire units. Subordinate elements of the battalion operate similar nets. Appendix 2 (Division Airspace Management Radio Nets—Air Defense).

- (5) 52d Mech Div FAAR target alert data display set (TADDS) data links. Each of the eight FAAR sections organic to the ADA Chaparral/Vulcan battalion operates a broadcast-type FM radio frequency data link radio station to transmit digital data that display location and tentative identification of aircraft over the division area on firing unit TADDS, including Chaparral/Vulcan and Redeye weapon systems. In the event of failure of the radio frequency data links, these nets have the capability for transmission of one-way voice signals, on a broadcast basis, to voice signal receivers in the TADDS. These nets may also be used in the voice mode to disseminate high-priority air defense advisories/instructions other than digital identification and location data. Appendix 2 (Division Airspace Management Radio Nets—Air Defense).

- b. Amplitude Modulated (AM) and Single Side Band (SSB).

- (1) Corps flight operations net (voice): This net is operated by aviation elements organic to the corps to which the 52d Mech Div is assigned or attached. The net is used for aviation advisory information and coordination when an FOC is established. The 52d Mech Div FCC operates a station in this net. When no FOC is established at corps, the division FCC enters a similar net established by the supporting Air Force area CRC. Appendix 1 (Division Airspace Management Radio Nets—Aviation).

- (2) ADA Chaparral/Vulcan battalion air defense liaison net (voice). This net is used to augment other communication means and is the primary means, in high-mobility situations, for coordination of air defense activities. Stations in the net include the battalion operations and intelligence section, the assistant air defense officer at the DAME, and the Chaparral/Vulcan battalion air defense liaison officer located at the supporting Hawk AADCP. Appendix 2 (Division Airspace Management Radio Nets—Air Defense).

5. *Telephone Service, Sole-User:* Point-to-point telephone circuits are established between the installations and activities listed below in decreasing order of installation urgency. All circuits indicated

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(ANX C (COMM) to SOP 1-52d Mech Div)

are installed and maintained by the 52d Sig Bn, unless otherwise stated.

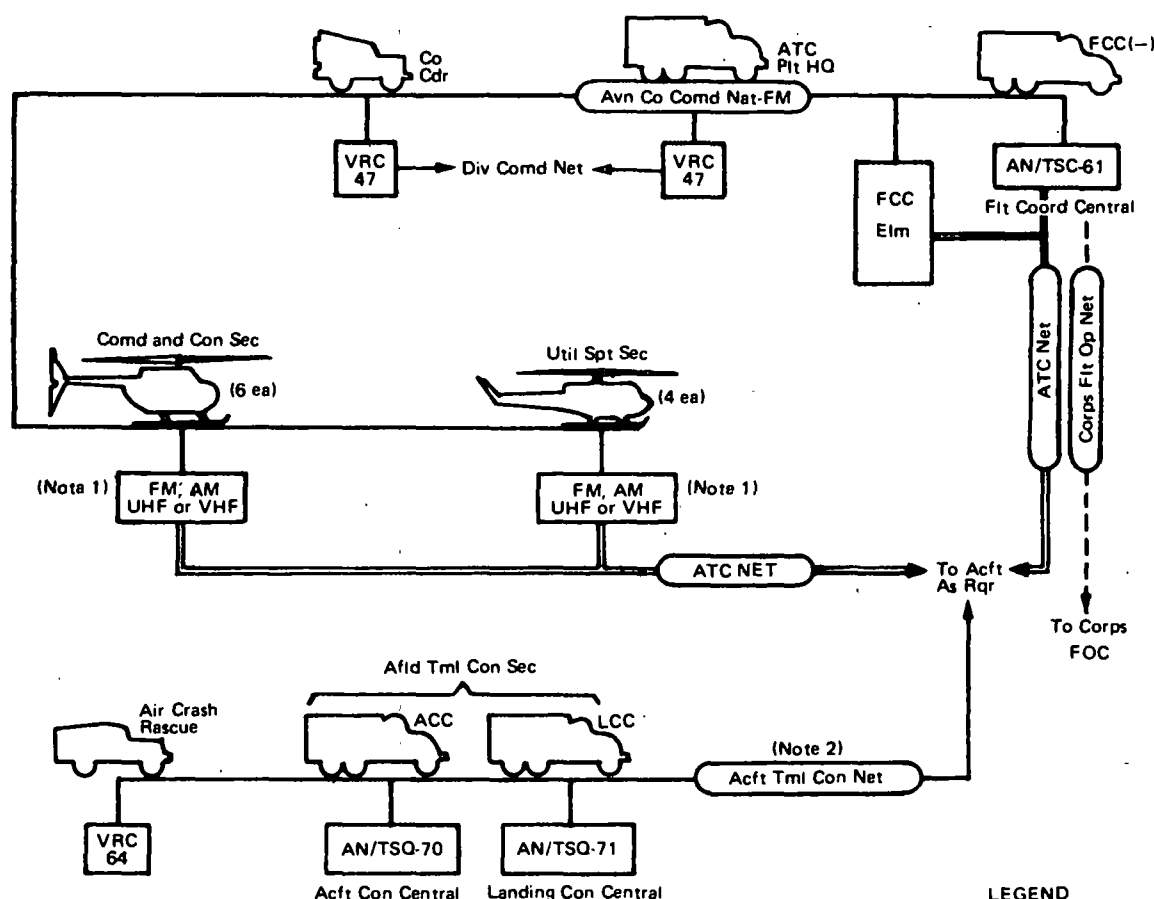
- a. DAME to Chaparral/Vulcan AADCP.
- b. DAME to division FCC.
- c. DAME to CAME (installed and maintained by corps signal elements).
- d. DAME to Hawk AADCP.
- e. Chaparral/Vulcan AADCP to Hawk AADCP (installed and maintained by supporting Hawk unit).
- f. FCC to Hawk AADCP.

6. **Communications Redundancy:** The command and common-user telephone and teletype systems and tactical radio nets defined in the 52d Mech Div TSOP are used to supplement the specific communication services provided for airspace management. Use is made of existing communications for disseminating early warning information.

Appendixes: 1—Division Airspace Management Radio Nets—Aviation

2—Division Airspace Management Radio Nets—Air Defense

APPENDIX 1 (DIVISION AIRSPACE MANAGEMENT RADIO NETS-AVIATION) to ANNEX C
(COMMUNICATIONS) to SOP NO 1-52d Mech Div



NOTES: 1. Radios part of aircraft. Each aircraft has radio set AN/URC-10 for rescue operations.
2. FM, UHF, or VHF radio; IFF; and ground control approach radar.

1. Radios part of aircraft. Each aircraft has radio set AIV/ONE to 130.
2. FM UHF or VHF radio: IFF; and ground control approach radar.

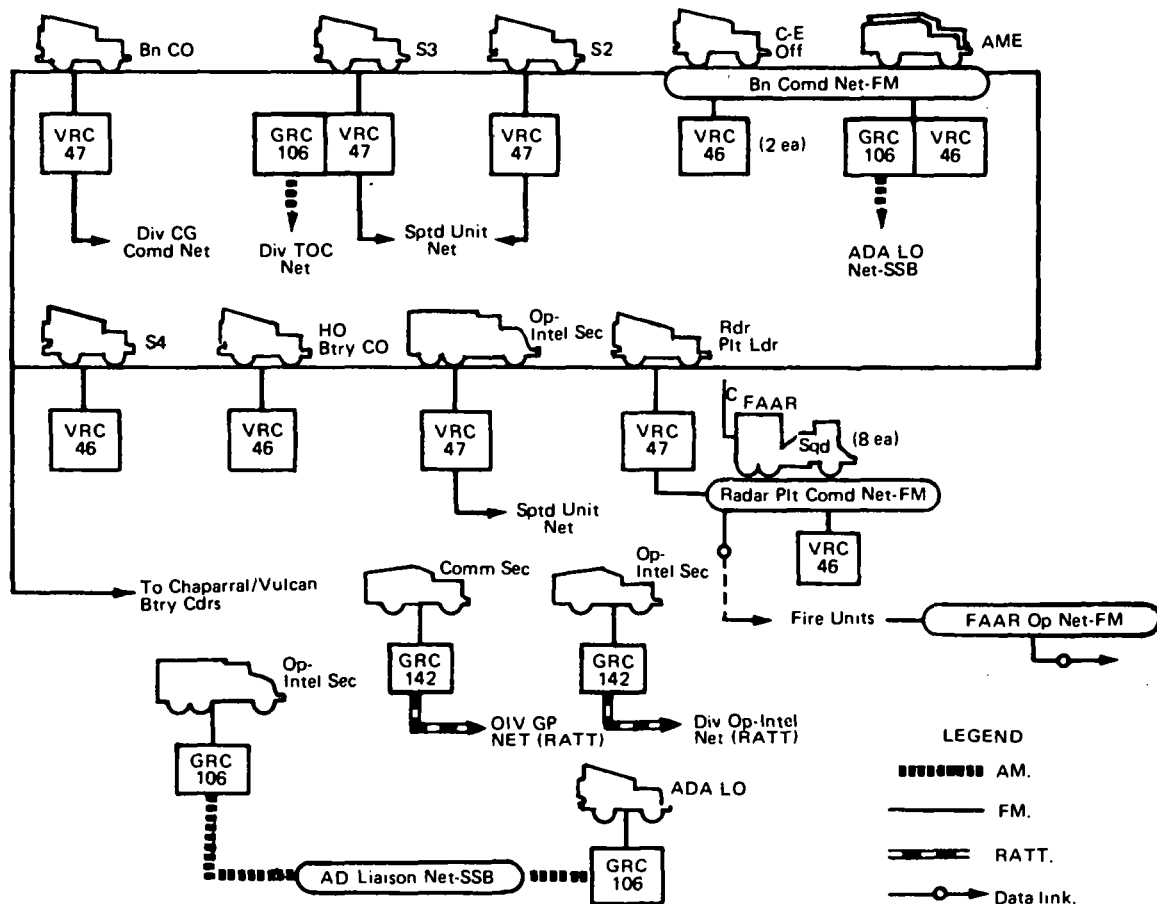
LEGEND

FM.
AM.
UHF

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APPENDIX 2 (DIVISION AIRSPACE MANAGEMENT RADIO NETS--AIR DEFENSE) to ANNEX C
(COMMUNICATIONS) to SOP NO 1-52d Mech Div



Example B-2. Format for Airspace Utilization Annex
to Division Operation Order

(The airspace utilization annex is normally found as an annex to an operation order, but has been shown here with the airspace management SOP as an example of an annex incorporating airspace management procedures.)

Copy no ____ of ____ copies
52d Mech Div
(Place issue with map
coord)
100800Z August 197 ____

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(Classification)

ANNEX B (AIRSPACE UTILIZATION) to OPORD _____

References: Map, series _____, sheet _____, edition _____, 1:250,000.

Admin/Log Order _____.

Time Zone Used Throughout the Order: ZULU.

1. SITUATION

- a. *Enemy Forces.* OPORD _____.
- b. *Friendly Forces.* OPORD _____.
- c. *Attachments and Detachments.* None.

2. MISSION

52d Mech Div provides airspace management to insure proper and efficient management and timely access to the airspace over the combat area by all users with minimum mutual interference.

3. EXECUTION

a. *Concept of Operation.*

(1) Airspace utilization.

(a) The coordinating altitude is 500 feet AGL.

(b) Indirect fire and ADA weapons are free to fire in all airspace, subject only to normal fire support coordination measures imposed by readiness conditions, weapon control statuses, and rules of engagement.

(2) Concept of air support.

(a) Army aviation. Annex J (Army Aviation) to OPORD _____.

(b) 29th TAF. Appendix 2 (Air Fire Support) to Annex D (Fire Support) to OPORD _____.

b. *Airspace Priorities.*

(1) US Air Force tactical fighter-bombers have priority on objectives _____ and _____ from _____ August.

(2) 47th Ambl Div aircraft and aerial fire support aircraft have priority along air routes RED and BLUE on execution of OPLAN _____ until completion of the airmobile operation on objective FINAL. Appendix 1 (Air Route Overlay).

(3) Aircraft will not enter restricted area without complying with restrictive measures in effect. Appendix 1 (Air Route Overlay).

(4) Area ORANGE has been declared a restricted area from the surface to 3,000 feet MSL for high-performance aircraft and is designated an air defense weapons-free area for high-performance aircraft. This restricted area is in effect on execution of OPLAN _____ until completion of airmobile operation.

(5) Hawk AADCP/FCC facility will be used for conflict resolution and avoidance headings when such service can be performed without degrading its primary air defense mission of defending the ground forces.

c. *Air Traffic Control Organizations.* FOC and FCC locations and areas of responsibility. Annex J (Army Aviation) to OPORD _____.

d. *Air Defense Rules of Engagement.*

(1) Beginning _____ 0500Z _____ 197__ to 1200Z _____, all air defense and non-air defense weapons will be on a weapons-free status. At _____ 1200Z, all weapons will revert to the rules in (2) and (3) below.

(2) High-performance aircraft penetrating area ORANGE (weapons-free status in effect _____) will be engaged if not positively identified as friendly. Helicopters operating in formation flights of six or more aircraft, unless under positive control and coordinated with the air defense forces, or positively identified as friendly, will be engaged.

(3) Aircraft operating within the combat zone and outside air defense weapons-free zones will not be engaged unless positively identified as hostile using selective identification criteria. Under air defense weapon control status weapons-tight, using selective hostile identification criteria, the following aircraft will be engaged:

- (a) * * *.
- (b) * * *.
- (c) * * *.
- (d) * * *.

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(ANX B (ASPA UTIL) to OPORD ____—52d Mech Div)

e. Emergency Reentry Procedures.

(1) Emergency IFF transponder settings are as prescribed in ____.

(2) High-performance aircraft returning without voice communications or IFF will climb to 8,000-foot MSL and fly recognition patterns as prescribed in ____.

Note. The joint commander has approved this procedure after full consideration of the enemy threat versus the possibility of misidentification.

(3) When feasible, communications will be established and radar vector assistance will be requested from the AADCP/FCC element. Such communications also serve to alert the ADA of an aerial emergency.

f. Coordinating Instructions.

(1) A coordinating altitude of 500 feet AGL is in effect over the 102d Abn Div AO.

(2) A coordinating altitude of 500 feet AGL is in effect over the 20th Inf Div AO.

(3) Air warnings will be disseminated by the DAME through operational channels.

(4) Air corridors RED and BLUE are restricted to use by 47th Ambl Div aircraft on execution of OPLAN ____ until completion of airmobile operations.

(5) Helicopter formation flights of six or more aircraft will be coordinated prior to the flight with affected ADA/Redeye unit and acknowledgement of coordination recorded.

4. SERVICE SUPPORT

Admin/Log Order ____.

5. COMMAND AND SIGNAL

a. Signal.

(1) Annex H (Communications-Electronics) to OPORD ____.

(2) Call words and frequency: 52d Mech Div CEOI.

(3) 29th TAF call words and frequencies: I Corps CEOI.

(4) Navigation facility en route: air navigation charts dated ____.

b. Command.

(1) Location of the DAME.OPORD ____.

(2) Location of 1st Bn (C/V, SP), 441st ADA, AADCP: Annex E (Air Defense) to OPORD ____.

(3) Location of 1st Bn (Hawk, SP), 458th ADA, AADCP/FCC element: Annex E (Air Defense) to OPORD ____.

(4) Location of FOC and FCC (-): Annex J (Army Aviation) to OPORD ____.

Acknowledge.

SMITH
MG

OFFICIAL:

/s/Doe

DOE

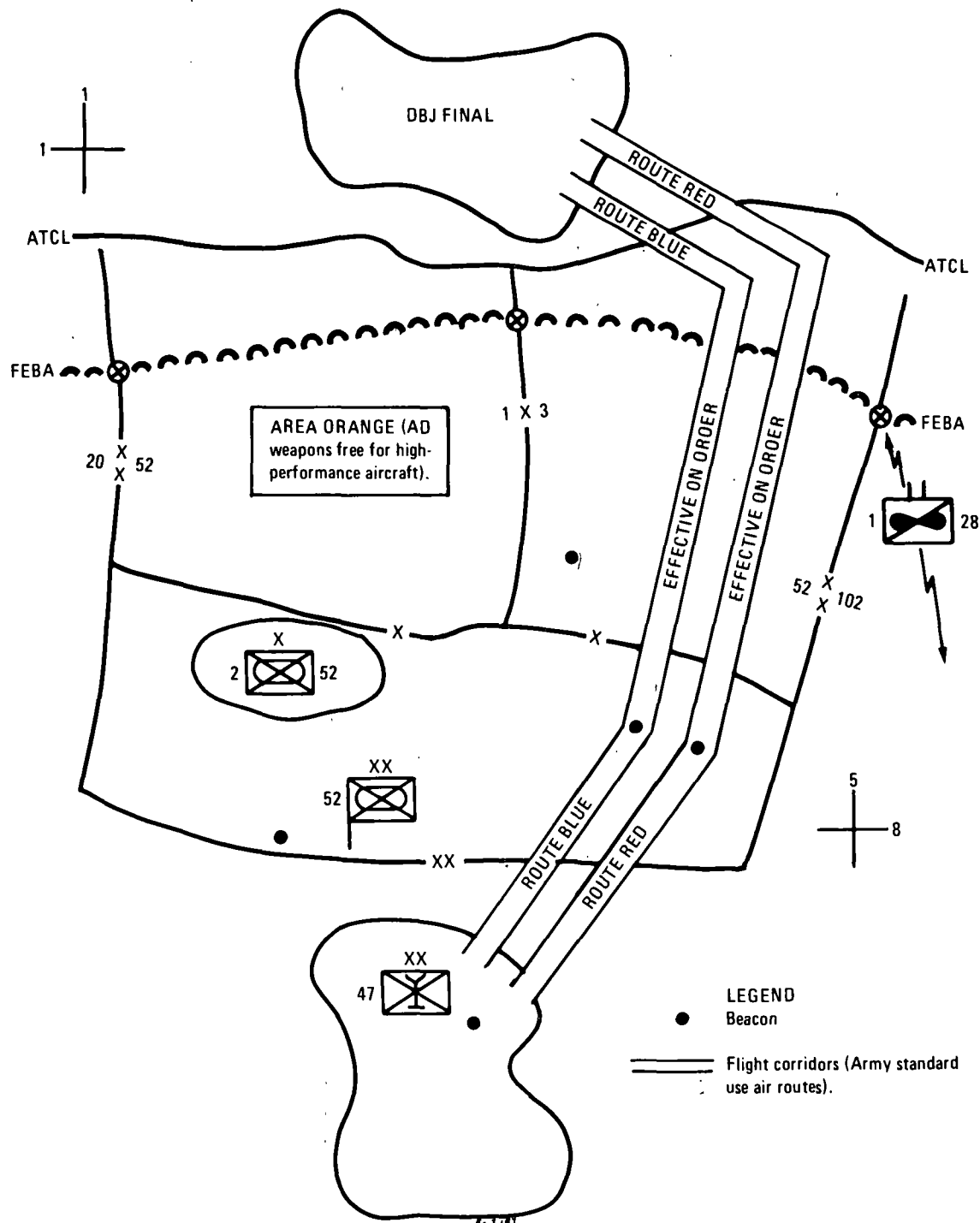
G3

Appendix: 1—Air Route Overlay

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APPENDIX 1 (AIR ROUTE OVERLAY) to ANNEX B (AIRSPACE UTILIZATION) to OPORD _____
52d Mech Div



(Classification)



APPENDIX C

EXAMPLE OF CORPS STANDING OPERATING PROCEDURES FOR AIRSPACE MANAGEMENT

Example C-1. Corps Airspace Management

Standing Operating Procedures

(Classification)

I Corps
FORT LEAVENWORTH, KANSAS
30 September 19____

STANDING OPERATING PROCEDURES NO 1

AIRSPACE MANAGEMENT

Section I. GENERAL

1. *References:* Annex A (References).
2. *Purpose:* To establish procedures for the coordination, integration, and regulation of airspace in the corps area of operation (AO).
3. *Concept:*
 - a. The Commander, 29th Tactical Air Force (TAF), is designated the area airspace management authority (AAMA) and the area air defense commander. The provisions incorporated in these standing operating procedures (SOP) are in accordance with the airspace management procedures established in 29th TAF tactical standing operating procedures (TSOP) and Unified Command/Joint Task Force Directive No 38. The corps airspace management element (CAME) will continually coordinate with the tactical air control center/control and reporting center (CRC) to insure an unimpeded flow of essential information concerning airspace management in the corps AO. The authority of the corps over each airspace user will vary with the situation.
 - b. These SOP are designed to identify functional responsibilities in a system based on the principle of management by exception. To accomplish this end, organizations assigned, attached, or under the operational control of this corps will insure that their procedures are such that any routine airspace management coordination is minimal. In addition, contingent procedures will be established at all levels of command to insure continuity of operations in a degraded airspace management system.
 - c. The CAME develops and coordinates procedures for the use of airspace by corps elements. Airspace management priorities and execution details will be identified in the airspace utilization annex to the corps plans/orders (example C-2).
 - d. The CAME is a manual planning and management facility with limited information-handling capabilities; therefore, the principle of resolving potential user conflicts by plans and SOP is emphasized. Plans and SOP will delegate the necessary authority to the lowest possible level of command for taking action to resolve an observed conflict. The provisions of these SOP will be followed during all training exercises involving the use of airspace to insure familiarity with procedures.

Section II. COMMAND AND STAFF RELATIONSHIPS/RESPONSIBILITIES

1. *Command:*
 - a. I Corps. The Commander, I Corps, is responsible for coordinating with the AAMA and establishing

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(SOP 1—I Corps)

an integrated airspace management system for the corps. The CAME serves as the focal point at corps for the coordination of airspace management.

b. Divisions. Division commanders are responsible for conducting airspace management within their division AOs. Division commanders will—

- (1) Provide the CAME with division requirements for terminal control zones.
- (2) Report significant Army aviation activities.
- (3) Coordinate significant preplanned indirect fires and provide for continuous update to the CAME.
- (4) Coordinate flights preplanned to operate above the coordinating altitude with the CAME. Immediate flights penetrating the coordinating altitude, will be coordinated with the flight operations center (FOC) at the CRC.
- (5) Recommend to the CAME establishment of airspace management aids within the division AO that are necessary for conducting operations.
- (6) Insure compliance with air defense weapon control status, rules of engagement, and aircraft flight rules/procedures.
- (7) Develop plans for integrating flight coordination center (FCC)/Hawk Army air defense command post (AADCP) airspace management functions for the Hawk battalion designated in direct support of the division.
- (8) Coordinate any airspace activity that may impact on other airspace users.

c. Separate Brigade/Battalion. The commander at separate brigade or battalion level will coordinate his airspace activities when those activities may impact on other airspace users.

2. Staff: Staff responsibilities and command relationships are as specified in FM 101-5, unless otherwise indicated in these SOP.

a. ACofS, G3, Operations. The ACofS, G3, will insure that these SOP are kept current and that they are followed during training exercises at all levels. He exercises staff supervision over airspace management and the CAME and insures that appropriate instructions pertaining to airspace management are published in the airspace utilization annex. He will insure that all necessary personnel required to staff the CAME are represented in the corps tactical operations center and that necessary communications are available for mission accomplishment. In addition, he will arrange for corps representation to the sector airspace management authority facility. In coordination with the ACofS, G2, aviation and air defense officers, he establishes airspace management procedures for the corps and recommends to the commander the minimum number of aircraft that should constitute a multiple flight and provides for the planning to positively control and coordinate such flights with the air defense artillery (ADA) forces.

b. ACofS, G4, Movements. The ACofS, G4, will provide the CAME with supporting airlift information pertaining to airspace management to include—

- (1) Preplanned and immediate airlift support requests and the priorities of approved requests.
- (2) Location of logistic installations.
- (3) Other combat service support information, as required, relating to air movements.

c. ACofS, G2, Intelligence. The ACofS, G2, will provide the CAME with intelligence information pertaining to airspace management to include—

- (1) Enemy air defense capabilities and threats to include radar range/altitude coverages and missile/gun capabilities.
- (2) Enemy air threat (number, types, tactics, and capabilities of aircraft).
- (3) Location of enemy nuclear, biological, or chemical attacks.
- (4) Possible enemy capabilities to counter airspace management aids, such as communications, radars, and beacons.
- (5) Possible enemy tactics for employing aircraft in the corps AO.
- (6) Likely enemy aircraft avenues of approach.

d. Aviation Officer. The corps aviation officer serves as the principal aviation advisor to the corps. To assist in airspace management he will—

- (1) Arrange for aviation personnel and necessary equipment to staff the aviation element of the CAME.

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(SOP 1—I Corps)

- (2) Arrange for an FOC or element to collocate with the nearest Air Force CRC/CRP.
 - (3) Provide aviation liaison personnel to the supporting Air Force CRC/CRP airspace management liaison section (AMLS).
 - (4) Determine flight plan requirements for Army aircraft operating in the corps under instrument meteorological conditions (IMC) and visual meteorological conditions (VMC).
 - (5) Recommend to the commander IMC or VMC minimums under which corps aircraft should operate.
 - (6) Establish procedures for integrating aircraft entering or leaving the corps.
 - (7) Recommend positioning of navigational aids and procurement of additional aids as required.
 - (8) Coordinate with the CAME for integrating divisional FCCs with FOC/CRC/CRP facilities.
 - (9) Recommend sites of corps airfields and request from the AAMA, through the CAME, a terminal control zone(s).
 - (10) Implement airspace management rules prescribed by the AAMA and establish the air traffic regulation system for the corps and disseminate this information to all aviation units operating within the corps AO.
 - (11) Coordinate with the ACofS, G3, on matters concerning the number of aircraft that constitute a multiple flight and recommend procedures for planning to control and coordinate such flights with the ADA forces.
 - (12) Disseminate coordinating altitude information as required.
 - (13) Insure that information pertaining to weapons-free zones and other restricted areas is disseminated to all aviation airspace users.
 - (14) Recommend standard use Army air routes connecting the rear operations area and the tactical operations area.
 - (15) Review the standing air defense rules of engagement for compatibility with aviation operations, and insure that pilots understand the implications thereof.
- e. Air Defense Officer. The senior air defense commander assigned to the corps (brigade, group, or battalion) is designated the corps air defense officer and, in this capacity, will locate fire units to facilitate the accomplishment of corps-directed priorities for air defense and to accommodate airspace management functions to the degree possible. Following are special requirements for the airspace management function:
- (1) Arrange for air defense personnel and necessary equipment to staff the air defense element of the CAME.
 - (2) Provide air defense liaison personnel to the supporting Air Force tactical air control center and CRC/CRP.
 - (3) Inform the CAME of AADCP and firing battery locations.
 - (4) Provide the CAME and AADCP early warning information generated by radar coverage from supporting unit air defense crews.
 - (5) Advise the corps commander on matters pertaining to air defense priorities in the corps AO or make recommendations on these matters to facilitate integration of Hawk and short-range air defense (SHORAD) weapons into each other and into the theater air defense system.
 - (6) Insure that the CAME is provided low-altitude radar coverage diagrams as soon as possible to facilitate air defense coverage and air traffic control systems integration.
 - (7) Recommend the assignment of tactical missions for corps air defense units. Prepare to provide one Hawk battalion in direct support of each committed division.
 - (8) Coordinate all Air Force air defense matters with the CAME, to include warnings and weapon control status changes.
- f. Fire Support Coordinator. The fire support coordinator for the corps is the Commander, I Corps Artillery. He provides the following airspace management information to the CAME through the fire support element.
- (1) Location of nuclear fires and significant preplanned indirect fires.
 - (2) Field artillery battery locations.

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g. Electronic Warfare Officer (Assistant G3, Operations/G2, Intelligence). The electronic warfare officer will—

- (1) Provide the CAME with estimates on enemy jamming capabilities and location of emitters when known.
 - (2) Provide the CAME with time and location of jamming operations by corps elements, adjacent units, or Air Force units that may affect the corps airspace management system.
 - (3) Inform CAME of other electronic warfare activities that might impact on airspace management.
 - (4) Be prepared to react to hostile or friendly electronic warfare activities that degrade the airspace management system.
- h. Chemical Officer. The chemical officer will provide the CAME with information concerning—
- (1) Friendly and enemy nuclear strikes with effective wind messages.
 - (2) Radiation fallout plots.
 - (3) Enemy employment of nuclear, biological, and chemical weapons.

Section III. FUNCTIONS

1. *Corps Tactical Operations Center*: The corps tactical operations center is the command installation in which necessary personnel and communication facilities are centralized to plan, control, and coordinate tactical operations. Within the corps tactical operations center will be located the elements necessary to coordinate airspace management functions. The chief of staff will insure that sufficient space is provided in the corps tactical operations center for collocation of the CAME, the fire support element, and tactical air support element. The CAME is the focal point for airspace management in the corps AO and for coordination with subordinate, adjacent, and higher headquarters. The officer-in-charge, CAME, has the authority to resolve conflicts.

a. *Corps Airspace Management Element*. The CAME receives information and requirements necessary for the management of airspace in the corps AO through coordination with the tactical air control center, CRC, FOC, fire support element, tactical air support element, aviation officer, air defense officer, G2/G3 elements, DAMEs, and liaison personnel. This list of personnel and elements should not be construed as limiting CAME sources of information. Staffing of the CAME will be as recommended for the corps airspace control element in FM 101-5. The CAME will—

- (1) Through the correlation of airspace management information and data received, identify and resolve potential conflicts concerning the use of airspace within the corps AO.
- (2) Develop and maintain the airspace utilization map.
- (3) Recommend minimum risk routes (MRR) through the tactical operations area and provide to the tactical air control center on request. Continually update MRRs.
- (4) Maintain current information on all restricted areas, standard use Army air routes, flight corridors, air defense weapons-free zones, significant preplanned indirect fires and nuclear strikes, airmobile operations, other major aviation operations, and preplanned close air support strikes and reconnaissance missions. Continually coordinate this information with the AMLS at the tactical air control center.
- (5) Coordinate with divisions and tactical air control center on matters concerning air defense warnings, weapon control statuses, rules of engagement, and visual identification criteria pertaining to air defense and Army aviation activities within the corps AO.
- (6) Maintain a current picture of the air defense and Army aviation posture within the corps AO and advise the commander and staff on such matters.
- (7) Coordinate with tactical air control center requirements for terminal control zones within the corps AO.
- (8) Maintain the status of required airspace management aids and disseminate information concerning their location/use as required.
- (9) Relay information concerning establishment of and changes to coordinating altitudes.

(Classification)

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(SOP 1—I Corps)

(10) Inform corps units of the number of aircraft designated as constituting a multiple flight and relay changes as they are received from the ACofS, G3.

(11) Coordinate with the tactical air control center to establish standard use Army air routes connecting the rear operations area with either the facility serving the divisions' main airfields or the divisions' main airfields.

(12) Disseminate information as obtained concerning enemy air and air defense activity.

(13) Coordinate with the tactical air control center concerning restricted areas and altitudes and provide it with the planned use of the area(s), geographical boundaries, effective times, procedures for movement into and out of the area(s), and method of disseminating warning information.

(14) Coordinate all requirements for flight plans, rules, and procedures with the tactical air control center.

(15) Provide airspace management information relevant to development of air movement plans and insure that airlift requirements for use of airspace are included in airspace utilization annexes to operation plans and orders.

b. Fire Support Element. The fire support element will provide to the CAME:

(1) Location of the fire support coordination line.

(2) Information concerning location of significant preplanned indirect fires (major preparation and final defensive fires only, not routine fires) and nuclear strikes.

(3) Location of significant immediate fires.

(4) Location of fire units.

c. Tactical Air Support Element. The tactical air support element, in cooperation with the tactical air control party, will inform the CAME of Air Force activity within the corps AO and of any Air Force aircraft passing through the corps AO.

(1) ACofS, G2 air, informs the CAME of all preplanned reconnaissance flights that will penetrate the airspace over the corps AO. Information must include time, route of flight, altitude, number of aircraft involved, and electronic countermeasures to be employed.

(2) ACofS, G3 air, informs the CAME of all preplanned and immediate tactical air requests in the corps AO. Information must include location, time and duration of strike, number of aircraft involved, and electronic countermeasures to be employed.

2. *Corps Flight Operations Center:* The corps FOC is responsible for providing en route flight following for Army aircraft within the corps AO and serves as a point of access into the Army air traffic control system. The FOC will be collocated or electronically connected with the CRC to provide maximum coverage to aircraft operating in the corps AO. The FOC will—

a. Serve as the focal point in the rear operations area for the collection of helicopter movement data and interface with the CRC.

b. Take necessary action to resolve observed conflicts concerning the use of airspace.

c. Serve as the primary control facility for control of Army air traffic.

d. Integrate air traffic entering the corps AO.

e. Provide vertical and lateral separation for Army aircraft during operations under IMC as cleared by the tactical air control center airspace coordination center.

f. Receive en route air traffic from and handover traffic to adjacent air traffic control facilities.

g. Provide FOC liaison with the AMLS at the CRC.

h. Relay information concerning airspace management as required by the CAME or the CRC.

i. During IMC, comply with AAMA-directed procedures.

j. Provide flight plan information to the appropriate airspace management/air defense facility or other agency for flight plan correlation purposes.

3. *Army Aircraft:*

a. Visual Meteorological Conditions.

(1) Aircraft assigned/attached to divisions and operating within the AO of the divisions to which assigned/attached will not be required to file flight plans with the FOC.

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(SOP 1—I Corps)

(2) Aircraft operating within, entering, or leaving the corps rear operations area, or crossing division boundaries, will file flight plans through the FOC (either written on forms _____, or by radio when within range).

(3) The FOC will coordinate with the CRC/CRP for flight following in the rear operations area.

(4) Corps aircraft operating in the rear operations area will use standard use Army air routes whenever possible.

(5) Use will be made of monitoring service to the maximum extent possible; however, responsibility for separation under VMC remains with the aviator.

(SOP 1—I Corps)

b. Instrument Meteorological Conditions.

(1) All aircraft operating under IMC will receive clearance from appropriate air traffic control facilities. The FOC is responsible for integrating Army air traffic into the CRC/CRP air traffic control facilities.

(2) Aircraft, tactical or support, committed on an emergency mission are exempt from filing formal flight plans and one of the following procedures will apply:

(a) The authority ordering the emergency mission will notify the appropriate air traffic control facility.

(b) When a mission is ordered from a location where an air traffic control element is not situated, the aviator will contact an air traffic control element as soon as practicable after becoming airborne.

c. Identification, Friend or Foe. All Army aircraft will comply with the published IFF code and mode settings.

4. *Communications*: Annex B (Communications).

COURTS
LTG

OFFICIAL:

/s/Mason

MASON

G3

Annexes: A—References

B—Communications

Distribution: A

(Classification)

Note. Example C-2 has been added at the rear of this SOP as an illustration of an airspace utilization annex.

(Classification)

ANNEX A (REFERENCES) to SOP NO 1-I Corps

References:

1. 29th TAF TSOP.
2. Unified Command/Joint Task Force Directive No 38.
3. AR 310-25.
4. AR 310-50.
5. FM 1-60.
6. FM 1-100.
7. FM 6-20.
8. FM 11-50.
9. FM 11-92.
10. FM 24-1.
11. FM (C)32-20.
12. FM 44-1.
13. FM 44-3.
14. FM 44-6.
15. FM 61-24.
16. FM 61-100.
17. FM 100-26.
18. FM 100-32 (Test).
19. FM 100-42/TACM 2-1 (Test) (when published).
20. FM 100-44 (Test).
21. FM 101-5.
22. JCS Pub 1.
23. JCS Pub 2.
24. JCS Pub 8.

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ANNEX B (COMMUNICATIONS) to SOP NO 1-I Corps

1. *Purpose*: This annex prescribes the communication networks normally established for support of airspace management in the corps AO.

2. *Applicability*: This annex applies to the units and stations (subscribers) that comprise the networks indicated. Unless otherwise indicated, the equipment required is organic to the using unit. Considerable interpretation may be required in establishing the interfacility network/services herein defined, based on the changing task organization of the corps. The decision concerning the actual structure of networks is based on coordination with theater air elements and the recommendation of the corps G3, with the advice of the corps aviation and air defense officers.

3. *Responsibilities*: Subordinate unit commanders will insure that the stations/subscribers required for airspace management in the corps area operate in the networks indicated.

4. *Radio Nets*: Appendix 1 (Corps Airspace Management Radio Net Structure).

5. *Multichannel Communication Services*: Point-to-point telephone and teletype services will be established as outlined below (all service is telephone, unless otherwise indicated).

a. Corps multichannel command communication system (installed, operated, and maintained by corps signal units).

(1) CAME to corps FOC.

(2) CAME to corps AADCP.

(3) CAME to DAMEs at 52d Mech Div, 20th Inf Div, and 102d Abn Div.

(4) Corps FOC to FCCs at 52d Mech Div, 20th Inf Div, and 102d Abn Div.

(5) Corps FOC to FCCs at 52d Mech Div, 20th Inf Div, and 102d Abn Div (teletype).

b. Corps ADA multichannel command communication systems (installed, operated, and maintained by corps ADA signal unit).

(ANX B (COMM) to SOP 1-I Corps)

(1) Corps AADCP to major subordinate AADCPs.

(2) Corps AADCP to major subordinate AADCPs (teletype).

(3) Corps AADCP to major subordinate AADCPs (automatic data link).

(4) Corps direct support Hawk battalion AADCP to DAME (installed by supported division).

(5) Corps direct support Hawk battalion AADCP to division FCC (when FCC is not collocated with the AADCP) (installed by supported division).

c. Theater Airspace Management Communication System (installed, operated, and maintained by theater air component communication support element).

(1) Tactical air control center to CAME.

(2) Tactical air control center to corps AADCP.

(3) CRC/CRP to corps AADCP.

(4) CRC/CRP to corps FOC.

(5) CRC/CRP to CAME (if no FOC is employed).

(6) CRC/CRP to each division FCC (if no FOC is employed).

Appendix: 1—Corps Airspace Management Radio Net Structure

APPENDIX 1 (CORPS AIRSPACE MANAGEMENT RADIO NET STRUCTURE) to ANNEX B (COMMUNICATIONS) to SOP No 1-I Corps

Net subscriber stations ¹	Corps comd net no — (AM—RATT)	ADA Gp ¹ comd-op net (FM/AM— voice)	Corps ADA liaison net (AM— voice)	ADA Gp ¹ ADC net (AM— voice)	AVN Gp ¹ comd-op net (FM/ AM—voice)	Corps flight operations net (AM— voice)	Corps air traffic control net (UHF)
Air Force TACC							
AMLS			X ³			X ³	
Air Force CRC/ CRP AMLS			X ³			X ³	
CTOC (main)	X-NCS ⁴						
CTOC (alt) ⁵	X ⁴						
Corps AME		X ⁴	X ⁴		X ⁴	X ⁴	
ADA Gp (AADCP) ²	X ⁴	X-NCS	X-NCS	X-NCS			

(Classification)

(Classification)

Net subscriber stations ¹	Corps comd net no _____ (AM — RATT)	ADA Gp ² comd-op net (FM/AM — voice)	Corps ADA liaison net (AM — voice)	ADA Gp ² ADC net (AM — voice)	Corps comd-op net (FM/ AM — voice)	Corps air flight operations net (AM — voice)	traffic control net (UHF)
Nike-Hercules ADA							
BN ³		X		X			
Hawk ADA Bn		X		X			
C/V ADA Bn ⁵ (Nondiv)		X					
Corps FOC					X ⁶	X-NCS	X-NCS
AVN Gp ²	X ⁴				X-NCS ⁷	X	
FCC 1, 2 ... (division)						X ⁷	X ⁷
Army aircraft					X ⁶	X ⁶	X ⁷

¹Subscriber stations not involved in airspace management are not shown.²May be brigade, group, or battalion, based on corps structure.³Provided by USAF.⁴Provided by corps signal brigade, group, or battalion, based on corps structure.⁵When established or when assigned.⁶When directed or as directed.⁷Provided by subordinate unit.

Example C-2. Format for Airspace Utilization

Annex to Corps Operation Order

(The airspace utilization annex is normally found as an annex to an operation order, but has been shown here with the airspace management SOP as an example of an annex incorporating airspace management procedures.)

(Classification)

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Copy no. ___ of ___ copies

I Corps

(Place issue with map coord)

210800Z August 19—

ANNEX B (AIRSPACE UTILIZATION) to OPORD—

References: Map, series—, sheet—, edition—, 1:250,000.

Admin/Log Order—.

Time Zone Used Through the Order: ZULU.

1. SITUATION

- a. *Enemy Forces.* OPORD —.
- b. *Friendly Forces.* OPORD —.
- c. *Attachments and Detachments.* None.

2. MISSION

I Corps provides airspace management to insure proper and efficient management and timely access to the airspace over the corps area by all users with minimum mutual interference.

3. EXECUTION

a. *Concept of Operation.*

(1) Airspace utilization.

- (a) Coordinating altitude is 1,000 feet AGL over the tactical operations area.
- (b) Coordinating altitude is 500 feet AGL over the tactical operations area.
- (c) Indirect fire and ADA weapons are free to fire in all airspace, subject to normal fire support coordination measures imposed by readiness conditions, weapon control statuses and rules of engagement.

(2) Concept of air support.

(a) Army aviation. Annex J (Army Aviation) to OPORD—.

(b) 29th TAF. Appendix 2 (Air Force Support) to Annex D (Fire Support) to OPORD—.

b. *Airspace Priorities.*

(1) US Air Force tactical fighter-bombers have priority on objectives— and — from — to — Aug 197—.

(2) 47th Ambt Div aircraft and aerial fire support aircraft have priority along corridors C1 and C2, northbound to air routes RED and BLUE (52d Mech Div AO) on execution of OPLAN§§§§ until completion of airmobile operation on objective FINAL. Appendix 1 (Air Route Overlay).

(3) * * *.

(4) * * *.

(5) * * *.

(6) Area ORANGE has been declared a restricted area from the surface to 3,000 feet MSL for high-performance aircraft and is designated an air defense weapons free area for high-performance aircraft. This restricted area is in effect on execution of OPLAN— until completion of airmobile operations. Appendix 1 (Air Route Overlay).

(7) AADCP/FCC facilities will be used for conflict resolution and avoidance headings without degrading their primary air defense mission of defending the ground forces.

c. *Airspace Management Facilities.* FOC and FCC locations and areas of responsibility. Annex J (Army Aviation) to OPORD—.

d. *Air Defense Rules of Engagement.*

(1) Commencing —Z Aug—, to —1200Z Aug—, all air defense and non-air defense weapons will be on a weapons-free status. At —1200Z Aug—, all weapons will revert to the rules in (2) through (6) below.

(2) High-performance aircraft penetrating area ORANGE will be engaged if not positively identified as friendly.

(3) Aircraft committing hostile acts will be engaged. Annex E (Air Defense) to OPORD—.

(4) Under air defense weapon control status weapons tight and using selective hostile identification criteria, the following aircraft will be engaged:

(a) * * *.

(Classification)

(Classification)

(ANX B (ASPA UTIL) to OPORD____Corps)

- (b) * * *
- (c) * * *
- (d) * * *

(5) Helicopters operating in the rear operations area in formation flights of six or more aircraft, unless under positive control and coordinated with air defense forces or positively identified as friendly, will be engaged.

(6) Aircraft, other than helicopters, operating within the combat zone and outside air defense restricted areas will not be engaged unless positively identified as hostile, using selective identification criteria.

e. Emergency Reentry Procedures.

- (1) Emergency IFF transponder settings are as prescribed in_____.
- (2) High-performance aircraft returning without voice communications or IFF will climb to an 8,000-foot MSL and fly recognition patterns as prescribed in_____.
- (3) Where feasible, communications will be established and radar vector assistance will be requested from AADCP. Such communications also serve to alert the ADA of an aerial emergency.

f. Coordinating Instructions.

(ANX B (ASPA UTIL) to OPARD——I Corps)

- (1) I Corps AO is within the_____airspace management sector.
- (2) Adjacent XII and XIV Corps are within the_____airspace management sector and_____airspace management sector, respectively.
- (3) Coordinating altitude of 1,000 feet AGL is in effect over XII and XIV Corps AOs.
- (4) The rear operations area is the area from the corps rear boundary forward to the division rear boundary.
- (5) The tactical operations area is the area from the divisions rear boundaries forward to the fire support coordination line.
- (6) *
- (7) Air warnings will be disseminated by the CAME through operational channels and the FOC by broadcast.
- (8) Air corridors C1 and C2 and air routes RED and BLUE (52d Mech Div AO) are restricted to use by 47th Ambl Div aircraft on execution of OPLAN_____until completion of airmobile operations. Crossing these routes will be coordinated with 47th Ambl DAME.

4. SERVICE SUPPORT

Admin/Log Order _____.

5. COMMAND AND SIGNAL

a. Signal.

- (1) Annex H (Communications-Electronics) to OPORD_____.
- (2) Call words and frequency: I Corps CEOI.
- (3) 29th TAF call words and frequencies: 29th TAF CEOI.

b. Command.

- (1) Location of the CAME: OPORD_____.
- (2) Location of 401st ADA Gp AADCP: Annex E (Air Defense) to OPORD_____.
- (3) Location of AAMA: 29th TAF Tactical Air Control Cent.
- (4) Location of FOC and FCC: Annex J (Army Aviation) to OPORD_____.

Acknowledge.

COURTS
LTG

(Classification)

(Classification)

(ANX B (ASPA UTIL) to OPORD____—I Corps)

OFFICIAL:

/s/Mason

MASON

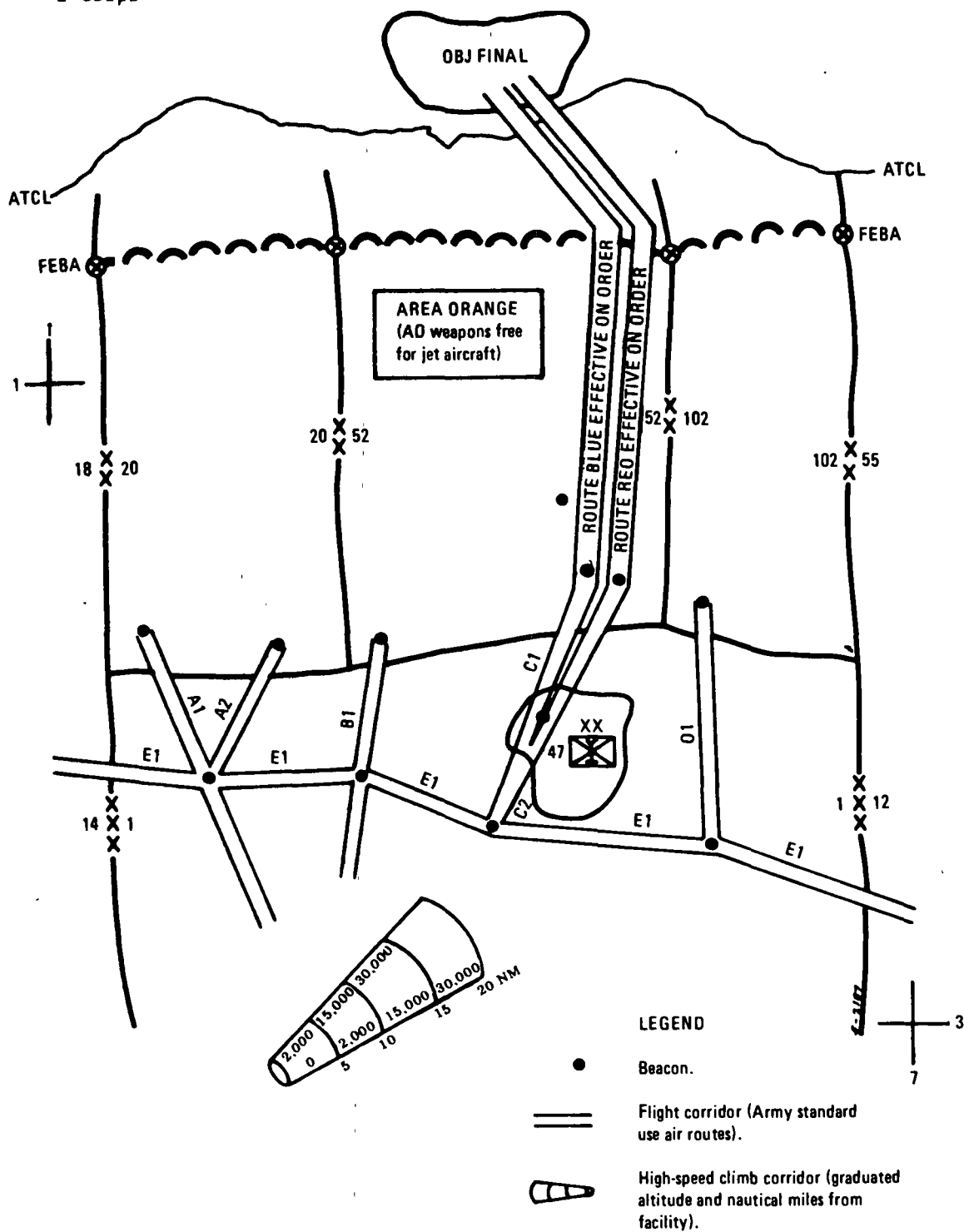
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Appendix: 1—Air Route Overlay

(Classification)

(Classification)

APPENDIX 1 (AIR ROUTE OVERLAY) to ANNEX B (AIRSPACE UTILIZATION) to OPORD _____
I Corps



(Classification)



APPENDIX D

GLOSSARY OF ABBREVIATIONS

The list of abbreviations is provided to enable the user to have readily available those abbreviations most commonly used in this manual.

A

AADCP	Army air defense command post
AAMA	area airspace management authority
ACC	airspace coordination center
AFCC/COMAFFOR	Air Force component commander/commander, Air Force forces
AFCCP	Air Force component command post
AGL	above ground level
AMC	airspace management center
AME	airspace management element
AMLS	airspace management liaison section
ASRT	air support radar team
ATC	air traffic control
ATCL	air traffic control line
ATRC	air traffic regulation center

C

CAME	corps airspace management element
CP	command post
CRC	control and reporting center
CRP	control and reporting post
CTOC	corps tactical operations center
C/V	Chaparral/Vulcan (abbreviated form)

D

DASC	direct air support center
DAME	division airspace management element
DDL	digital data link

F

FAAR	forward area alerting radar
FAC	forward air controller
FACP	forward air control post
FCC	flight coordination center
FOC	flight operations center
FSE	fire support element

I

IFF	identification, friend or foe
IFR	instrument flight rules
IMC	instrument meteorological conditions

M

MSL	mean sea level
MRR	minimum risk route

N

NCS	net control station
-----	---------------------

R

RATT	radio teletype
------	----------------

T

TACC	tactical air control center
TACP	tactical air control party
TADDS	target alert data display set
TASE	tactical air support element

TAWN

tactical air warning net

TOC

tactical operations center

V

VFR

visual flight rules

VMC

visual meteorological conditions

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